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SKIN, BATHS, & SOAP

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THE
SKIN,
BATHS, BATHING, AND SOAP.

By Francis Pears.

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PREFACE.

Who ought to write a book on a given subject—he who has a practical knowledge of it—a knowledge extending over many years, or he who is merely theoretically acquainted with it, who must borrow the ideas of others, and whose knowledge can never be other than second-hand? There can be no doubt that for the essential purpose for which books are written—namely, to give reliable information, that practical knowledge has the precedence as a qualification, and in this belief the present author ventures upon the publication of these pages.

During thirty years he has been engaged in the profession of a Soap refiner, and the numerous unsolicited Testimonials he has during that time received, from scientific men who had no motive to praise except the recognition of professional excellence, and from the public generally, who had no interest in applauding an article produced, unless it met in some manner their requirements beyond their expectation—must be regarded as evidence of success.

The value of a work like the present, if we may assume it to have value, must depend upon the authority of the author—and that authority must, as we have said, depend principally upon his personal experience. We shall show what this experience has been, and the sort of hereditary right he has to speak upon this subject.

So far back as the year 1807, Mr. Andrew Pears, the grandfather of the present writer, discovered a process by which he could deprive the best soap of a great portion of its alkali, and at the same time render it Transparent. The novelty of this discovery was very great, and its importance not less so. Mr. Pears communicated his secret to a scientific gentleman, who in what way, or from what motive does not appear, mentioned it in his turn to a Mr. John Watson: but of the fact of its being so mentioned there was no manner of doubt, and the said Mr. John Watson actually commenced making the soap, and eventually, in order to secure what had been surreptitiously obtained, he took out a patent. Mr. Andrew Pears did not hesitate to vindicate his prior and unquestioned right to the patent, and soon after a Trial took place in the Court of King's Bench to determine this question. On this occasion Mr. Nicholson, the translator of "Fourcroy's Chemistry," Mr. Accum, Experimental Chemist of the Royal Institution, and many other scientific gentlemen were examined before Lord Ellenborough and a Special Jury. The newly discovered Transparent Soap was proved to have originated in the experiments of Mr. Andrew Pears, and to be an article of the most desirable utility, and possessed of all the detergent properties of soap in their most active perfection, and at the same time free from all impurities and deleterious qualities. Lord Ellenborough was so satisfied of Mr. Pears's claim, that he facetiously remarked to the Jury, "Gentlemen, I think I can shave Mr. Watson as close as ever he was shaved with his soap in his life (laughter)."* And then his Lordship exhibited, from an analysis of the evidence, the unfounded claim set up by Mr. Watson so convincingly, that the Jury gave a unanimous verdict in favour of Mr. Pears's claim to the discovery and the patent; and established his authority solely to prepare and vend the said Transparent Soap. This occurred on the 6th of December, 1809.

The indifference of the uneducated public with respect to soaps is marvellous. Anything which is cheap or well puffed is used without inquiry. People might as well eat anything as wash with anything—the skin being a more delicate organ even than the stomach. What a wonderful thing is the skin! It is the largest and most important integument of the whole human organism! What millions of pores it contains! The minutest aperture may absorb the deadliest poison. Once in contact with the surface of the body, whether the particle be held in a miasma or dissolved in the water of ablution, the pore, like a fatal canal, conveys it into the system, whence its eradication may be impossible, and where it may generate untold mischief. How important then is the question—what is the nature of the detergent element we shall apply to the skin in daily ablutions, and in baths of the toilet? When we reflect that lavation is of hourly occurrence, it is easy to see that the health of the skin, as well as its beauty, may be daily endangered by pernicious soaps.

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* Report of the period.

Wonderful! most wonderful are the works of God; but greatest of them all is the human frame. Well might Galen be filled with astonishment as he surved its marvels; but how surpassingly beautiful every part of it appears when its secret wonders are unfolded to us by the microscope. To describe fully any portion of the human body would fill a volume. Great anatomists have, by analogy, been able to determine the entire outward form and habits of life of an extinct animal by the examination of a single fossil bone—so exact and connected in its most minute details is every part of their structure. The same reasoning which applies to these beings (whose remains have been swept away myriads of ages since from the face of the earth, and by the means of which remains we have perfect mementoes of their former existence) is equally applicable to those now living. Who can doubt that a goodly volume might be written on the heart, the regularity of whose pulsations excels the finest movement of a Dent's chronometer?* or of the brain, the seat of all thought, and probable source of all vital power? Equally deserving a great book are those less important parts, each of which has its separate functions playing in unison with all the other members of the great whole. The portion which I have selected is that delicate envelope which covers so admirably the marvellous structure of man. Much has indeed been written on the skin, but still a brief sketch, with a practical aim, may be acceptable to the general reader. The structure, functions, and preservation of the skin, will form the distinct parts in this little work. The object of the author is not to write a medical treatise, but to present a collection of curious facts, with a view to impress upon the mind the importance of the skin, and the means by which its health may be preserved. As it will readily be admitted that its sanative condition depends much upon cleanliness, a short account will be added on Baths and Bathing, ancient and modern; and on the Manufacture of Soap, on the authority, where relevant, of Dr. Ure and others. Those soaps which are beneficial for personal use will be distinguished from those which are injurious. Some account of the various perfumes of the bath, the earliest known and those most used—their object and effects, will find due place in these pages, and of course a description of those choicer soaps of the toilet, which owe their existence to the discovery and skilful manipulation of modern experience.

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* I have calculated that the number of pulsations of the heart of a man, 30 years of age, assuming the average to be 60 per minute, will have been 6,771,600,000.

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THE SKIN, BATHS, BATHING, AND SOAP.

CHAPTER I.

THE SKIN AND ITS FUNCTIONS.

The importance of the subject of the human skin, on which not only beauty but health depends, can scarcely be exaggerated. By its structure and condition the whole of the internal economy is influenced. Neither the eye, the hair, the figure, nor the manner, exert an influence in love, compared to that inspired by the fairness and perfection of the skin. Complexion is the great charm of woman, when the complexion is what nature intends it to be. We gaze with delight on the tiger and the snake, and forget their natures in admiration of the glossy and burnished dress they wear—then how much more are men enchanted when to the sweetness of woman is added the radiance of hue which a smooth and healthy skin alone imparts. Poets sing its charms in the tenderest lyrics, the greatest painters, in all ages and nations, have exerted their utmost powers to portray it. The fame of Etty in modern times rested solely on his skill in this respect.

The very name "skin" is significant of its importance. The word is derived from the Danish, and literally means natural covering of the flesh.* The skin is considered as consisting of two distinct parts; indeed, a man may be said to have two skins. In popular language they may be thus described. The outward or surface skin is called the scarf skin—the anatomical name of this skin is the *epidermis.* The under or second skin is called the cutis or true skin; it is also named the *cutis vera.* Between these two there is a third membrane, which used to be regarded as a kind of third skin, called the *rete mucosum,* or mucous network, which is now known to be but the last-formed portions of the epidermis. This mucous network gradually makes its way to the surface, and renews the epidermis as it is worn away or peels off.†

The cutis is a name commonly applied by unprofessional persons to the outward skin, but by anatomists it appears to be restricted to the under skin or *cutis vera.* The outward or scarf skin is made up of flattened cells agglutinated together in many irregular layers. These are at first round, and contain nuclei, with soft and moist contents; but by successive formations beneath them, they are gradually pushed to the free surface, and in their progress become flattened into irregular scales, lose for the most part their nuclei, and, at last, are thrown off. As the cells change their form, they undergo chemical and physical changes in the nature of their contents; for those in the deeper layers contain a soft, opaque, granular matter, soluble, as when immersed in nitric acid, whilst the superficial ones are transparent, dry, and firm, and are not affected by that acid. It would seem as if their contents were converted into horny matter, and that a portion of this substance is employed to cement them together. The more firm and transparent superficial part of the epidermis may be separated from the deeper, softer, more opaque, and recently formed part, which constitutes, as we have observed, what is named in anatomy the *rete mucosum*.* The epidermis, when the skin is blistered, is readily seen to be a thin, and nearly transparent membrane. It forms a protective covering over every part of the true skin, and is, itself, quite insensible, although it possesses a decidedly organised structure.† Its thickness varies from one twenty-fourth to one twelfth of an inch. It is thickest in the palms of the hands and soles of the feet, where the skin is much exposed to pressure; and it is not improbable that this may serve to stimulate the subjacent true skin to a more active formation of the epidermis. Many of the cells contain pigments,‡ and often give the membrane more or less of a tawny colour, even in the white races of mankind; the blackness of the skin in the negro depends entirely on the cuticle. The pigment is contained principally in the cells of the deep layer, or *rete mucosum*, and appears to fade as they approach the surface; but even the superficial part possesses a certain degree of colour. In the skin of the negro, the coloured cells intermix with colourless cells, and on the proportion of the two the depth of colour depends; they are situated in the deeper and softer parts of the *rete mucosum.* The darker parts of the European skin owe their colour to pigment cells like those of the negro, only smaller in size. According to Krausse, the dark colour of the outward cuticle depends chiefly on the presence of cells which have dark brown nuclei; the substance of the cell being also tinged, but less deeply than the nucleus, and the colour being diffused through the mass, and not caused by molecules. When the epidermis of the Negro is removed by means of a blister, it is renewed again of its original dark hue, but if the skin be destroyed to any considerable depth, as by a severe burn, the resulting scar remains long white, though it at length acquires a dark colour. The black colour has been proved, by the experiments of Sir Everard Home, to be of great service in protecting the negro from the effects of a tropical sun. But its preservative effects are not limited to the Negro. It is in itself a bad conductor of heat, and being placed immediately under another bad conductor—the outer epidermis, and over a quick one—the *cutis vera,* it must materially contribute to the uniformity of temperature so necessary to an animal destined to inhabit hot climates, and to rule in them all. The *rete mucosum* may also with propriety be called the interior epidermis, and the colour of the skin in every part of the world, from the fairest Circassian to the blackest Negro, is regulated by the cells just mentioned. Great care is required to separate the interior epidermis from the exterior. The *rete mucosum*, or interior epidermis, is more equable in its thickness than the outward epidermis, it is softer, and forms a delicate intermedium between the insensible cuticle and the nervous and sensible substance of the true cutis. In consequence of this it serves to graduate and preserve the sensibilities of the true cutis, and to secure the regular and appropriate performance of its numerous functions. When the papillæ of the skin become elongated by diseased growth, they attain a considerable length, before either this or the cuticle break, or become perforated by them. Both are elongated with them, not indefinitely, but nevertheless to a very remarkable degree. In attending to the beauty of the skin, it is not only on outward influences, but to the general inward condition of the body that its becoming appearance depends. Every one is born, says Friedlander,* with a skin peculiar to himself, that is, a skin which sympathises with his peculiar constitution. This extreme sensibility is chiefly owing to the nerves which are more developed under the skin than in the interior of the body, hence the greatest pain which can be inflicted is that which affects the greatest portion of the surface or skin of the body, as burning or flaying. "Women," says Friedlander,† "who, to preserve the skin, confine themselves within and avoid the sun, as well as everything else which seems to them injurious, can doubtless render themselves for some time softer and whiter; but the least over-secretion of bile, the slightest change of the weather, the least indigestion, or the least affection of the mind, in fact, a single ray of sunshine, may shorten the days or rather the moments of her who studies nothing else." How much the beauty of the skin depends upon the internal economy, we see in the appearance of the healthy children in the country, compared to those who live in large towns. Every thing which is prejudicial to health must be more or less injurious to the skin, and of course the same remark applies to those vices by which a morbid state is engendered. The experienced practitioner can often determine by the colour of the skin only the inward seat of the disease, as in certain diseases of the liver when the skin appears of a yellowish colour. The perspiratory pores on the palm of the hand are 3,528 in number to the square inch. There are seven millions in the whole body of an adult person. Can we be too careful of so wonderful an organ? But we will quote the whole of a memorable passage from the pages of a great and recent investigator of the diseases of the skin.

---

* The word skin is often used figuratively in Scripture; thus to "flay off the skin," or pluck off the skin, imports to oppress men till nothing but the mere life is left them. Mic. iii., vv. 2, 3. To "escape with the skin of one's teeth," is to escape with nothing but life, having, as it were, the very teeth dashed out, and scarce a mouth left to complain. Job, c. xix., v. 20. "Skin for skin" was an ancient proverb, importing that a man will gladly save his own life at the expense of the death of relations, or any other outward loss. Job, c. ii., v. 4.

† *Vide* Carpenter, An. Phy. § 492.

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* Quain and Sharpey.

† V. Relzuis, in 1848, prepared and presented to the Paris Academy of Sciences a portion of human skin, which having been macerated in sulphuric acid, was so transparent that the cells and glands were beautifully visible to the naked eye.

‡ Pigment is a coloured granular matter secreted in cells called pigment cells. Cells of this kind give blackness to the eye. "Similar pigment cells, having great variety in their form, are to be found composing the black spots on the skin of the frog, water-newt, etc."—*Carpenter*, *An. Phy.* § 533.

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* De l' Education Physique de l'Homme, p. 172. Chacun est né avec une peau qui lui est particulière, aussi bien qu'avec d'autres dispositions plus ou moins heureuses!

† Les femmes qui, pour la ménager, s'enferment et renoncent au soleil, comme a tout ce qui leur semble nuisible, peuvent, sans doute, se rendre, pour quelque temps, plus douce et plus blanche; mais la moindre sécrétion plus abondante de bile, le moindre impression un peu vive de l'air, la moindre indigestion ou la moindre affection de l'âme, un rayon du soleil enfin portera atteint e aux beaux jours, ou plutot aux beaux moments de celle qui ne songe pas à autre chose. Ib. p. 172.

"Taken separately, the little perspiratory tube, with its appended gland, is calculated to awaken in the mind very little idea of the importance of the system to which it belongs; but when the vast number of similar organs composing this system are considered, we are led to form some notion, however imperfect, of their probable influence on the health and comfort of the individual. I use the words 'imperfect notion' advisedly, for the reality surpasses imagination, and almost belief. To arrive at something like an estimate of the value of the perspiratory system in relation to the rest of the organism, I counted the perspiratory pores on the palm of the hand, and found 3,528 in a square inch. Now, each of these pores being the aperture of a little tube about a quarter of an inch long, it follows that in a square inch of skin on the palm of the hand there exists a length of tube equal to 882 inches, or 73½ feet. Surely such an amount of drainage as 73 feet in every square inch of skin (assuming this to be the average for the whole body) is something wonderful, and the thought naturally intrudes itself —What if this drainage were obstructed?

"On the pulps of the fingers, where the ridges of the sensitive layer of the true skin are somewhat finer than in the palm of the hand, the number of pores on a square inch was 2,268, and the length of tube 567 inches, or 47 feet. To obtain an estimate of the length of tube of the perspiratory system of the whole surface of the body, I think that 2,800 might be taken as a fair average of the number of pores in the square inch, and 700, consequently, of the number of inches in length. Now, the number of square inches of surface in a man of ordinary height and bulk is 2,500. The number of pores, therefore, 7,000,000; and the number of inches of perspiratory tube, 1,750,000. That is, 145,833 feet, or 48,600 yards, or nearly twenty-eight miles.*

Could we need a stronger argument for enforcing the necessity of attention to the skin?

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* Wilson. Haller's estimate of the extent of surface of the human body is 15 feet square, that is 2160 inches.

CHAPTER II.

THE SKIN—ITS DEPENDENCIES AND PROPERTIES.

No intelligent idea of the skin, and its place in the human economy as a whole, can be formed without some attention being given to the subject of the relative connection, sympathy, and dependencies of the skin, with regard to the intestinal surface, and the contents and secretions which may be lodged or produced there. Thought, for a few minutes, must be bestowed upon the internal structure of the human frame. From the commencement of the intestinal canal in the pharynx, to its termination at the extremity of the rectum, an indissoluble connection of function with the skin is discernible. A local disturbance there often throws the fine branches and connections of the recurrent nerves into disorder, convulses the stomach, and sets the secretory vessels of the skin in extraordinary action. No sooner are some substances received into the stomach, than the skin begins to show its displeasure, and imperatively to require the relief of its associate from the unwelcome intruder. Erysipelas, urticaria, and very frequently minor annoyances, give ostensible notices of the enemy within, hold out the signals of distress, and sometimes of danger, call aloud for prompt assistance, and if it be unattainable, lead on to serious, to long, and, in some instances, to fatal disease. From sudden, or from continued exposure to cold, hot, impure, foggy, and loaded atmosphere, how many changes arrive! Not only are the eyes, the nose, the ears, the palate, the throat, almost immediately, and often violently disordered, but parts not in contact with them, in consequence of their relation to the skin, and the impossibility of carrying on their functions unless the skin be also healthy, become, as it were, deranged. Vomiting, inappetence, indigestion, constipation, or diarrhœa, are produced. "What important diseases of the liver, of the lungs, of the bowels, and of the kidneys—what congestions, what inflammations, what catarrhs, what diarrhœas, how frequently consumption, how often dropsy—arise from neglect of and inattention to the skin. When I indicate the relations, you will at once see the importance of the skin. Look at the extent of the skin. The lungs, the liver, the kidneys, are organs comparatively small when compared with the skin in its whole extent. The extent of the surface of the body of a man of ordinary size is fifteen square feet—that is, if you stripped the skin entirely off a man's body, it would form a rug or carpet three feet wide by five feet long."* The actions of the liver, and its dependent and assisting viscera, are disturbed; everything goes wrong, and unless the cause be removed, the effects are not very likely soon to cease. So also, on the other hand, should the viscera of reception, digestion, absorption, etc., be deranged, either from substances taken from without or generated within, erysipelas, urticaria, miliary eruptions, and febrile heat may arise, with great suddenness and violence, so as to force the skin imperiously to demand the prompt correction of the offending causes. Instances like this are often seen after eating muscles, lobsters, pickled salmon, etc.; and excess in anything may occasion them. They have been known to be brought on by eating an apple hastily, when the patient was rendered heated and thirsty by riding; and there are peculiar substances that agree with persons in general, which nevertheless produce these effects on particular individuals. "I once knew," says Chevalier,* "a lady who could not take powdered rhubarb without an erysipelatous efflorescence almost immediately showing itself on the skin; and yet she could take the *infusion of rhubarb* with perfect impunity;" perhaps, because the woody particles of the powder adhered to, and irritated the mucous membrane. In some instances the evil is, in general, very transient, and easily removable; but in others it is more permanent and difficult of cure. And in cases less strongly marked, other outward and visible signs may, nevertheless, be often readily discovered by an accustomed and observant eye, in the hue and general appearance of the integument. But whether they may be readily observed or not, their effects are real, and often circumstances of great consequence in the practice of surgery, as well as of medicine; for unless we keep an eye upon them, so as to direct the clothing of patients, the ventilation and temperature of their chambers, and the due cleanliness of their persons, and also that of their attendants, evils may be communicated to or originated from the skin which shall frustrate the best endeavours of medical skill, by throwing the viscera into a state of disorder, or keeping them so, and thus tending to suspend or destroy the digestive, the nutritive, and, of course, the restorative processes of nature, and therefore to diminish the general strength, weaken the nervous energies, without which no repair can go on, and lead to those excesses or deficiencies of the ordinary excretions which so often interrupt and defeat the efforts of the constitution; and the sanguine hopes and expectations of the surgeon. Copious perspiration renders the quantity of salts and of lithic acid in the body more abundant in proportion. Through the skin there must, in many cases, as of diabetes, be a great quantity of aqueous matter absorbed from the atmosphere. We know also from the histories of some shipwrecked persons, that even under a state of constitutional health, a degree of sustenance appears to have been afforded for a time by their dipping their clothes in the sea, and wearing them wet. The effect of these circumstances on the quantity and quality of the insensible perspiration appears not yet to have been experimentally ascertained. The skin of the frog may be cited as a very remarkable example in comparative anatomy of the power of absorption. It is not generally known that a person who perspires much may enjoy the use of dry hands for a considerable time by holding a young frog gently in his palms. It is said that if a pinch of snuff be dropped on the back of a frog, the creature will instantly be attacked with convulsions and die, and it is probably from this remarkable absorbing power of the skin of Batrachians that toads have been found in the centres of stones and the timber of trees, where they must have been entombed for centuries. We must bear in mind other sympathies, often reaching to distant parts, established by the close interweaving of the nerves and vessels in the skin, and manifested in the relief of affections of the internal organs, such as the liver, the lungs, etc., both by stimulating and soothing applications, applied externally, sometimes where no direct connection appears to exist. These are facts strongly illustrative of the able remarks of Sir B. Brodie, and of the doctrine of remote as well as of continuous sympathy, taught by John Hunter, and very imperfectly understood before his time. When in a perfectly healthy condition, the skin is soft, warm, and covered with a gentle moisture; the circulation of the blood is also in a state of due activity, giving it a fresh and ruddy colour. The degree of redness, as, for instance, in the cheeks, is usually in proportion to the exposure to the outer atmosphere, such exposure, when not too severe, causing active circulation of the blood, not only throughout the body, but to the most minute vessels on the surface; hence the pale and unhealthy hues of persons confined to the house and close sedentary employment, and the ruddy colour of those who spend much of their lives in the open air. Where the exposure is too severe, or more than can be conveniently counterbalanced by the animal heat, a chill is the consequence, and the skin assumes a pale appearance, the forerunner, it may be, of bodily indisposition. The insensible perspiration has been suppressed, and the lungs have got into a state of serious irritation. Warmth and other remedies restore the healthy functions of the pores; but where the cold is neglected, inflammation of the bronchiæ, or air-tubes communicating with the lungs, or some orther pulmonary affection, ensues, and the lamentable issue may be—death. Some years ago, Dr. Smith made investigations as to the extent of loss by perspiration during hard labour in a heated atmosphere. Eight workmen, in a large gas works in London, where they were required to work diligently and be exposed to a high temperature at the same time, were weighed before going to work, and immediately afterwards. In an experiment in November they continued to work for an hour and a quarter, and the greatest loss sustained by any one man was two pounds fifteen ounces. In another experiment in the same month, one man lost four pounds three ounces in three-quarters of an hour; and in an experiment of the same kind in June one man lost as much as five pounds two ounces, in an hour and ten minutes. It must be borne in mind, however, that this extraordinary difference was not caused by any direct loss of bodily substance, but by a diminution of general weight, resulting from the decomposition of the food recently taken, as well as from the exhalation of other waste fluids then lurking in the system. This shows the magnitude of the operations which the skin, as an exhaling membrane, can perform. A piece of skin greatly magnified shows us a surface covered with small conical eminences, called papillæ; in these are the extremities of the nerves of sensation, and also the outlets or pores. Under these are the layer, containing the colouring matter before described, and the under skin. Ducts descending through this supply nourishment to the skin; and ducts of a spiral form, convey the perspiration to the surface. Intermingled with the whole are numerous blood-vessels and nerves. By this apparatus, portions of the fluids no longer required in the system are conveyed to the surface of the body, whence they escape into the atmosphere usually in the form of vapour, but sometimes as perspiration. In the extreme heat of summer, or when a person is engaged in hard work, this liquid exhalation is very apparent. Not being observable in ordinary circumstances, it is styled the insensible perspiration.

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* C. Larkin, M.R.C.S.L.

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* Lectures on the General Structure of the Human Body, by Thomas Chevalier, F.R.S. 1823. P. 203.

In this office of an exhaler, the skin acts as an auxiliary to the lungs, which throw off more copiously the waste liquor of the system in the form of vapour and deteriorated air. The amount of these two kinds of exhalation—the cutaneous, or skin exhalation, and pulmonary, or lung exhalation—has engaged the inquiries of various writers on human physiology, two Frenchmen, Lavoisier and Seguin, having had the honour of presenting the most accurate survey of the subject. Dr. Andrew Combe, in his treatise on the "Physiology of Health," alludes as follows to the result of Seguin's investigation. He found that the largest quantity of insensible perspiration from the lungs and skin together amounted to thirty-two grains per minute, three ounces and a quarter per hour, or five pounds per day. Of this, the cutaneous constituted three-fourths, or sixty ounces in twenty-four hours. The smallest quantity observed amounted to eleven grains per minute, or one pound eleven and a half ounces. The medium or average amount was eighteen grains a minute, of which eleven were from the skin, making the cutaneous perspiration in twenty-four hours about thirty-three ounces. According to this statement, a man in good health, and under ordinary circumstances, exhales through the skin two pints of liquid daily. When the extent of surface of the whole is considered, which is calculated at 2,500 square inches, these results will not appear extravagant. "Although," says Dr. Combe, "the precise amount may be disputed, it is quite certain that the cutaneous exhalation is more abundant than the united excretions of both bowels and kidneys; and that, according as the weather becomes warmer or colder, the skin and kidneys alternate in the proportions of work which they severally perform, most passing off by the skin in warm weather, and by the kidneys in cold. The quantity exhaled increases after meals, during sleep, in dry, warm weather, and by friction, or whatever stimulates the skin; and diminishes when digestion is impaired, and in a moist atmosphere." Perhaps no part of anatomy has been so much neglected as the skin; yet surely that extent of surface by which so much is absorbed, so much is transpired, so much is felt, so much is regulated, and by which all other parts are enclosed, has a powerful claim on our investigation. The outward cuticle answers some of the most important purposes in the animal economy. All animals are provided with it, in some form or other; and many have it renewed several times, some indeed frequently, and some periodically, some during the course of their lives casting it off at the appointed seasons entire. In the case of some insects, and of some serpents, these exuviæ are left almost in the complete form of the creature which has quitted them. Nor are vegetables destitute of a similar covering. In these, it has been supposed by M. Mirbel, and others, to consist merely of an indurated or desiccated surface of their parenchymatous, or alburnous substance, which is erroneous. The animal outward cuticle not only covers the skin, but is also continued from the boundaries of the under skin, over parts accessible to the atmosphere, and where the true characters of the under skin are entirely lost. It extends inside the nostrils, the tympanum (ear-tube), mouth, etc. Haller says, "I have known no part of the human body which could be exposed to the air with impunity, except the outward cuticle and the enamel of the teeth." Such, he observes, is the dryness, or the acrimony of the air, that the naked under skin can never remain in contact with it. This element (the air) changes the nerves, and even the tendons, into hard, pellucid, and fragile cords. The bones when denuded, and subjected to its immediate access, quickly die, and afterwards exfoliate their suffering surfaces, or throw out granulation from those surfaces to supply its place: but the outward cuticle supports it, without injury or decay; and appears immutable under its influence, in all variations of climate and temperature in the habitable world. And though the sudden application of excessive heat or cold frequently occasions it to fall off, we may learn from the experiments of Dr. G. Fordyce and Sir C. Blagden in heated rooms, and from the accounts of voyages to the polar region, that this is not so much, in either extreme, from the destructible nature of the outward cuticle itself by these agents, in ordinary cases, as from the suddenness and excess with which their influences are exerted on the organisation underneath it, from which it is nourished. Where, indeed, the outward skin is continued from the true cutis, over the serous and mucous membranes, its extreme thinness causes it to elude general and distinct observation, not instituted with a careful and express view to its detection. It is, nevertheless, capable of demonstration, and, being moistened continually by fluids secreted for that purpose, is preserved in a state capable of affording a mild and effectual protection to those delicate and sensible parts, from which the privation of it is always severely felt, and felt to be an injury. It enables them to perform their fine functions in peace and with regularity, and is so constructed, and so applied to them, that though insensible itself, it preserves both their common and peculiar sensibilities in perfection, in harmony, and in ease. It guards against dangers from within the body and from without.* The chemical composition of the outward skin is, I believe, not exactly known. Mr. Hatchett found it to consist chiefly of gelatine. Its extraordinary preservative powers are well exemplified in Egyptian mummies. It was the practice of that people, in the process of embalming, previously to take off the outward cuticle from the body, in order to enable it to imbibe the bituminous substance by which it was to be defended from putrescency; and it appears that in all those parts or patches, where the cuticle has escaped removal, the impregnation by the bitumen has not properly taken place, the parts underneath appearing to owe their preservation entirely to a lateral communication of the conservative power of the bituminous substance which has impregnated the adjoining parts.† These effects are dependent on the countless millions of transfusing and absorbing vessels, which are placed in a surprising variety of arrangements, to carry on, to harmonise, protect, and perfect the functions of the under skin, and the numerous parts of which that complicated and most important organ is made up, and with which it is studded over in innumerable points. It will be important to remember, that although the surface cuticle, or outer coat of the three layers, which constitute what is commonly called the skin (although the real or true skin is that which is the nethermost layer), is sometimes termed "*insensible*," the expression is only used comparatively, and to express that its vital power is feeble compared to the *rete mucosum* and *cutis vera*, which it overlies and protects, and which consequently depends upon it for its preservation and the due performance of its functions. In fact, all the three layers of the skin sympathise with each other, and readily repair any breach or injury which may be made in either. It is an admirable provision in nature that man, who was destined to reason and act according to his judgment, should excel all other animals in the sense of "touch," which resides principally on the tips of the fingers; and was made erect, so that they should not be rendered callous or less sensible by walking on them. When carefully dissected off, and separated from all adventitious matter, in a middle-sized man, the skin weighs about four pounds and a half. The marks of superior feeling or touch, in the skin, are the projections above the common surface or papillæ. The nerves are there not only longer, but larger. The contractility of the skin is a property very like that of muscle; it contracts, relaxes, and even vibrates in some places, on certain occasions. The skin, from the action of cold and other causes, becomes so rough that it resembles the skin of a goose. Some physiologists have considered the epidermis or outward skin as a substance merely spread over the surface like a film, and supposed it to be formed by exudation from the cutaneous vessels, while both Bichat and Cuvier seem inclined to regard it as without any regular arrangement of its parts, and possessed of no visible organisation. Although, from the fact of cutaneous perspiration, it follows that the epidermis must be furnished with pores, or passages of some kind, for its transmission; yet, with the exception of Bichat, anatomists have confessed themselves unable to detect these passages. One of the most remarkable properties of this part is its power of retaining fluids of all kinds, and preventing their escape from the surface.

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* Chevalier, p. 112. † Ibid, p. 115.

Another property deserves notice. The defensive portion of the skin or corium, says Wilson,* is constructed of excessively minute fibres, which are collected into small bundles, or strands, and these latter are interwoven with each other, so as to constitute a firm, strong, and flexible web. The pores are round or oval in shape, and are separated from each other by strands of fibres. The strands are connected with the fibrous web in which the subcutaneous fat of the body is deposited, and the open meshes are filled with little bags of fat. That the distention and contraction of the membrane should meet with no check, the open meshes are filled, as we have seen, each with a soft compressible cushion of fat, and the entire skin is preserved from the violence of contusion by being pillowed on a soft and elastic medium, the subcutaneous fat of the body, which breaks the force of a blow, by yielding before it. The cricketer, unknowingly, relies on this contrivance, when he receives the flying ball on his outstretched hand; and we all test its importance in the power which we possess of supporting, for hours together, the whole weight of the body upon so delicate a structure as that of the sensitive layer of the skin of the sole of the foot.

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* "Management of the Skin." By Erasmus Wilson, F.R.S. 2nd Ed., 1847, pp. 29-33.

CHAPTER III.

THE SKIN AND ITS DISEASES.

ALTHOUGH the epidermis appears to have but little connection with the vital powers of the system it becomes very visibly affected in disease. This skin is so susceptible of sympathising (like every other part of the body) with the general state of the animal economy, that even strong mental emotion has been known, in some cases, to change it from a healthy to a diseased state in a wonderfully short space of time. M. Biett relates a case of a young person who, being deeply afflicted by sudden and very distressing news, was attacked in a few hours with a severe attack of lichen agrius. Some persons are much more liable to cutaneous diseases than others, of which this case is a striking instance. Cutaneous diseases may be traced to very remote antiquity. They appear to have been very common among the Egyptians, and in Leviticus the people afflicted with *tsarath* (leprosy) are directed to be separated from the rest and have no communication with others, for fear of contagion—"He shall dwell alone; without the camp shall his habitation be" (Lev. xiii. 46), and his garments are to be burnt. According to Herodotus, who wrote a thousand years after Moses, the laws of the Jews respecting leprosy were drawn from the customs of the Egyptians. The Hebrew word "tsarath" was translated into the Greek (lepra) to denote a severe cutaneous disease, but the characters assigned by the

Greeks to the disease so named bore no resemblance, according to Moses, to tsarath. By the term used by the Greeks they expressed a scaly affection of the skin, in which the surface only was affected, while the disease tsarath spoken of by Moses penetrates and destroys to the bone.* Dr. Willan† describes leprosy as characterised by scaly patches of different sizes, but having always nearly a circular form. In this country three varieties of the disease are observed, but as this brief treatise is not intended for a medical work, the reader is referred for further information on this subject to the authorities previously quoted.

The outward epiderma is a product of the derma (cutis), which it serves to envelop and defend, and of the sanative condition of which it is a delicate test, being continuous, and difficult to distinguish from it. The difficulty is increased by the circumstance that when a portion of the outward skin is made to occupy an internal position, it assumes the humid character of mucous membrane; and when a portion of the inner skin (cutis vera) becomes external, it loses its moisture by evaporation, and then takes on the ordinary appearance of skin. This reciprocal metamorphosis of the two great investing membranes, or rather, the two divisions of the one great investing membrane of the body, is occasionally seen in domestic life. * * It is dependent, obviously, on the analogy of structure subsisting between the two parts of the same membrane. To illustrate the transition of these membranes into each other, I may refer to the eyelids, on the margin of which the skin becomes mucous membrane; the former covering the outside of the lid, the latter the inside of the lid and front of the eyeball. The red surface of the lips is an illustration of a mucous membrane which has become dry by exposure to the atmosphere, its junction with the skin taking place at the abrupt line where the red joins the lighter-tinted covering of the face. The entrance tube of the ear is a cul-de-sac of about an inch in length, and lined by mucous membrane. This circumstance explains the discharges of matter from the ear which not unfrequently take place in children, for it is the ordinary character of mucous membrane, when in a state of inflammation, to send forth a discharge, but not so the external skin. An important medical law is founded on the continuity and similarity of structure of the investing membrane of the body. This law resolves itself into three expressions:

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* See Cazenave et Schedel Maladies de la Peau; Paris, 1858.

† See Willan on Cutaneous Diseases; 4to.

Firstly, that disease, affecting a part of a membrane, is liable to spread to the whole.

Secondly, that disease of the mucous membrane may spread to the skin, and *vice versa*.

Thirdly, that disease of a part of a mucous membrane may become translated to a distant part of the skin, and *vice versa*.

As illustrations of a popular kind of these three positions, we may adduce, in evidence of the first, the spreading nature of St. Anthony's fire, or erysipelas; of the second, the itching of the nose and lips in children from irritation of the alimentary canal, caused by the presence of worms; or the eruption around the lips which follows slight attacks of cold or feverishness. The third position explains the coincidence of dyspepsia and other internal disorders with cutaneous rashes and eruptions* Diseases of the skin are more frequent among children than adults and old persons, who are the least liable to them. The nature of manual occupation has a considerable influence on its health: thus, workmen who are in the habit of handling acrid or mineral substances are liable to various eruptions; but keeping the hands dirty appears to have no appreciable ill effect — thus sweeps, colliers, and many artizans, are not frequently troubled with cutaneous disease. The weather and the seasons affect the skin much more than is generally supposed, and the spring, which most persons would look upon as conducive to its health, is more productive of eruptive disorders than any other time of the year. The intensity of its diseases increases also with the heat of the climate; and in Greece, Palestine, Egypt, and India they are frequent and violent, and assume appearances unknown in colder and Northerly countries. A close and humid atmosphere favours the development of disease; thus they appear very often in Picardy, Flanders, Holland, in certain parts of England and Scotland, in Holstein, Norway, the Crimea, and on the borders of the Danube and its *embouchures*.* For the same reasons they abound more in large cities and towns where the streets are narrow and crowded, especially where the situation is low. The effect of the sun on the skin is well known. Lorry observed a case in which the skin became marked with spots by the electric spark, which could never be taken out. The influence exercised by the nature of the food on the skin is very great, showing the sympathy which exists between its condition and that of the stomach and the digestive organs. Thus the use of meat, particularly of pork, provokes the appearance of elephantiasis, so named from the legs of people afflicted with the disorder growing scaly, rough, and wonderfully large, at an advanced period, like the legs of an elephant. A person may labour under the disease many years without finding much alteration in the general health, except during the continuance of the attacks; and perhaps the chief inconvenience he will experience is the enormously bulky leg which he drags about with him. The incumbrance has indeed induced many who have laboured under this disease to submit to an amputation; but the operation seldom proves a radical cure, as the other leg frequently becomes afflicted. Hiliary observes that he never saw both legs swelled at the same time. Instances where they have alike acquired a frightful and prodigious size have, however, frequently fallen under the observation of other physicians.

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* "Healthy Skin." By Erasmus Wilson. 1855.

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* "Les professions les plus sales en apparence sont loin d'êtres celles où l'on observe ces maladies plus fréquemment."—Cazenave Maladies de la Peau, p. 49, 3rd Edit.

Mahomet forbade the Jews and Mussulmen to eat pork, and perpetuated the laws so strictly enjoined in Leviticus. In 1799 Baron Lorry, in his expedition to Egypt, found all the French who accompanied him more or less ill from eating pork and salt fish, and many of them were attacked with leprous eruptions, which first broke out on the face and afterwards on the extremities. The determination of effects from the interior of the body to the surface is often exemplified by the use of certain medicines. A respectable-looking man may be seen at the present time walking about London, whose skin is of a deep blue colour, which pervades his whole body, from which circumstance he has obtained the cognomen of "the blue man," a name first given to him in America. The colour has been produced by taking large and frequent doses of nitrate of silver, prescribed to him as a cure for epileptic fits, to which he has been long subject. Discoloration thus produced lasts for the entire life of the individual, without alteration. It may, however, diminish slightly in the course of years, and it is a curious fact that the change takes place upon all parts of the body at the same time, and more intensely on the face and hands, from their being more exposed to the light. The bluish tint subsequently becomes of a greenish colour.

There are upwards of ninety varieties of disorder affecting the skin, every one of which is known and clearly described; the greater part of them being carefully figured in various works. The number, however, varies according to the principle of classification adopted; one view, for instance, refers certain diseases to a particular category, while another excludes them from it.* Old philosophical works contain many curious accounts of skin diseases, of which we shall mention two instances. A girl named Ann Jackson, born at Waterford, in Ireland, was afflicted at three years old with horny excrescences on different parts of the body, and at twelve or fourteen years of age a film or horn grew over her eyes, so that she could scarcely perceive the difference of colours. The horny excrescences grew chiefly about the joints, and were fastened to the skin like warts, and about the roots resembled them much in substance, though towards the extremities they grew much harder and more horny; at the end of each finger and toe one grew as long as the finger or toe itself, between the nail and the flesh, and curved like the claw of a bird. On the other joints of her fingers and toes were smaller ones, which sometimes fell off, when others grew in their places. The whole skin of her feet, legs, and arms was very hard and callous, and grew daily more and more so; on her knees and elbows, and round the joints, were many horns; two more remarkable at the point of each elbow, which twisted like rams' horns—that on the left arm was above half an inch broad and four inches long. On the lower part of the body grew a great number, which were flat by frequent sitting. At the armpits and nipples of her breasts small hard substances shot out, much slenderer and whiter than the rest; at each ear also grew a horn. The skin of her neck became in turn callous and horny like that of her hands and face. She ate and drank heartily, slept soundly, and enjoyed, with trifling exception, the comforts of health. A somewhat similar case was communicated by Mr. Locke in the "Philosophical Transactions," in 1687. He saw, in May, 1678, at the Hospital at Paris, called La Charité, a young lad of Brie, between nineteen and twenty years old, who had upon the ends of all his fingers excrescences resembling horns. Another very extraordinary affection of the skin is its occasionally becoming perfectly loose. Mr. Haslam, in his interesting observations on madness, remarks that he has frequently noticed in persons who have suffered a long and violent paroxysm of that disease, that the scalp, particularly at the posterior part of the head, has become so loose that a considerable quantity of it could be gathered up by the hand. Many years ago, there was a female gipsy, who used to show herself at the anatomical schools in London, who had a large portion of loose skin on the left breast and side, which she could wrap over her body, to a considerable extent.

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* See Dr. Willan and Dr. Bateman, on Description and Treatment of Cutaneous Diseases.

"The constituents of the skin, exclusive of the scarf-skin, are the true skin, the perspiratory apparatus, the oil-producing apparatus, and the hairs and hair tubes. These four parts form the ground-work of a primary classification into as many divisions of diseases of the skin. Of the diseases of the true skin a second division comprises inflammation, under which a large majority of the diseases of the skin may be ranged—enlarged growth of the papillæ of the sensitive layer, disorders depending specially on the state of the vessels, disorders depending specially upon the state of the nerves, and disorders depending specially upon the state of the colouring principle. The diseases of the perspiratory apparatus are such as have reference to excess, diminution, or alteration of the perspiratory fluid, the diseases of the oil-producing apparatus to excess, diminution, and alteration of the oily product, detention of the product within the tubes and glands, and inflammation of the glands; and the diseases of the hair and hair-tubes—to augmented and diminished quantity of hair, alteration in colour, disease of the hair pulps, disease of the hair tubes, and altered direction of the hair."* These diseases of the skin may all be traced to known causes—intemperance, sudden changes of temperature, producing colds or fevers—including change of climate, syphilis, hereditary cutaneous disease, over-fatigue, unhealthy occupations, excess in diet or inaction, long confinement with want of proper exercise, keeping the skin continually damp (hence washerwomen suffer from depositive inflammation of the derma), or too dry, as that form of dermous disease to which bakers are subject, or handling corrosive or uncongenial substances in certain trades. A fruitful cause of disease is washing with soap made of deleterious ingredients. The following diseases of the skin are the most common, and will sufficiently illustrate the maladies of the epidermis:—

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* "A Practical Treatise on Healthy Skin." By E. Wilson, 1845.

Erysipelas. A diffused inflammation of the skin and subcutaneous cellular tissue, affecting a part of the surface of the body, and accompanied by fever, which is contagious and infectious. The local inflammation has a special disposition to spread; it is attended by a redness which disappears under pressure with the finger, to return as soon as the pressure is remitted. It is often accompanied by vesications containing a limpid, amber-coloured serum, which quickly bursts and forms there dark coloured crusts. When the redness is vivid and tumefaction considerable, it is called St. Anthony's fire. The erysipelas presents a great many varieties, according to its severity and the part of the body it may occupy.* Sometimes it is a mild disorder, confined to a small portion of the skin (simple erysipelas); sometimes the inflammation extends deeper than the skin, and involves the structures beneath it (phlegmonous erysipelas); while in other cases the inflammation attacks the face, extends to the head, and is attended with very great danger to life. Simple erysipelas usually terminates on the third or fourth day; when blisters form, it may continue for eight, ten, or even fifteen days; and in cases of a severe kind, and when the parts become mortified, it may last for several months, and terminate in death. There is also much danger to be apprehended when it suddenly leaves any part (as the face, scalp, &c.) to attack the brain; or when it occurs in old persons of broken down constitution, in drunkards, &c., or after severe injuries. "Simple erysipelas" is generally ushered in by febrile symptoms, such as shivering, head-ache, hot skin, quick pulse, sickness of stomach, pains about the loin, and lassitude. In the part which is about to be attacked the patient often experiences a feeling of heat, itching, or weight. On the second or third day the inflammation of the skin makes its appearance, and is attended with the ordinary signs of inflammation—viz., redness, heat, pain, and a certain degree of swelling. The colour of the inflamed part is commonly deep rose, of a shining aspect, and soon spreads uniformly over the surface. The pain is often of a burning kind, and attended with itching or a tingling sensation; it extends all over the inflamed surface. The swelling is not considerable, unless the disease is very severe; it is uniformly spread over the inflamed part, and is more easily detected by the finger than by the eye. About the third or fourth day blisters of various sizes sometimes appear on the inflamed skin, but in other cases the inflammatory symptoms begin to subside on the fourth and fifth days, and soon terminate, without any accident, in a separation of the scarf-skin or cuticle from the true skin beneath. Such are the general symptoms and progress of very distressing and prevalent disorders.

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* Every practitioner knows that the sensibility of the skin, and its susceptibility to disease, are in no two places alike; and, moreover, that the structure of the skin itself is not the same throughout. For example, the skin of those parts where the hair grows is more complicated than that on other parts of the body, where this appendage is not produced. The skin of the palms and soles of the feet differs considerably from that of the scalp, or from that on which the beard grows. The capillary circulation also modifies the tendency of the cutaneous envelope to disease. For instance, the facility with which the blood advances to, or recedes from, the surface on the face and head, and the mechanical obstruction to its return in the lower extremities, must necessarily influence the production of cutaneous disorders in those regions, but each in a different manner. Indeed, the character of the same disease will often vary, so as to give an idea of a totally different complaint, according to the region in which it is developed. —Dr. Burgess, in *London Gazette*, New Series, Vol. xviii., p. 315.

Phlegmonous erysipelas is a more severe form of the complaint, which attacks the structures underneath the skin as well as the skin itself. It generally occurs in young or strong persons, and affects the limbs more frequently than any other part of the body. Erysipelas is sometimes an epidemic malady, and prevails extensively in hospitals or crowded establishments.

Urticaria—nettlerash. This eruption on the skin takes its name from the close resemblance which it has to that produced by the stinging of nettles. No part of the body is exempt from nettlerash. It appears in large, flat, elevated patches or weals of irregular shape, hard, of a pale red colour, but in some instances whiter than the surrounding skin, and is attended with severe itching and tingling. It generally appears in the morning, vanishes in the course of a few hours, and perhaps reappears three or four times in the course of the day. After breaking out repeatedly in this manner, it usually disappears entirely at the expiration of six or eight days, somtimes much sooner. Nettlerash occurs most frequently in young people and females; it is generally, if not always, connected with the disorders of the digestive organs, and, in particular constitutions, is readily produced by certain articles of food, as lobsters, crabs, mussels, and other kinds of shell fish; cucumbers, mushrooms, &c. It sometimes arises from eating salmon or mackerel, and in the West Indies the same effect has been produced by the king-fish, barracuta, and land-crab. In the case of this disorder, low diet, mild laxative medicine, and drinking freely of lemonade or barley water, containing a little nitre, are generally recommended. It is a very curious fact, that some persons of great cutaneous susceptibility have the power of exciting the eruption at any time, by merely scratching the skin. Dr. Winterbottom was twice violently affected, by eating the sweet almond, and Dr. Gregory, who was himself affected with it after eating part of a cucumber, mentions two instances of persons attacked in a similar manner, from drinking porter. Mental excitement from nervous debility, occasioning a peculiar susceptibility of the cutaneous nerves, will also suddenly produce it. Erasmus Wilson says, * "In a lady who was lately under my care, I have watched the red weals appear and creep along the skin, and disappear while I purposely engaged her in conversation on indifferent subjects. A word, a look, the slightest excitement, would immediately bring out a copious eruption. It occurs chiefly in the summer season, and is said to be more prevalent in cold climates, as that of Russia, than in those of the south. Persons who possess a thin and irritable skin, who are plethoric, and of a sanguine temperament, are most liable to this disease, and for this reason it is more common in the female than the male sex. It is very frequent in children, particularly during the period of dentition."

Lichen is an eruption of clustered or irregularly disseminated papulæ attended by itching, stinging, etc. The pimples are about the size of millet seeds, reddish in colour, or scarcely different from the natural hue of the skin. They are usually developed in clusters, and appear in single or successive eruptions. They are non-contagious. Of this disease there are seven principal varieties. It principally attacks those persons who are of a nervous and irritable temperament. Increased temperature appears to have great influence in producing this disease, and it is frequently met with on the arms and face of persons employed near the fire, such as cooks and smiths. Local irritation, from wearing flannel or coarse linen next the skin, will sometimes produce it; also irregularity of diet, and intemperance. It is especially referrible to intemperate habits or great fatigue. It is not dangerous to life.

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* "Diseases of the Skin;" 2nd Ed., p. 148.

Herpes zoster (Shingles). This singular disease is characterised by an eruption of vesicles, extending in a semi-circular form round one half of the body. In general, the eruption is preceded for two or three days by a feeling of languor, slight headache, occasional rigors or shivering, loss of appetite, increased pulse with heat, aching, a stinging or burning pain in the part where the vesicles are about to make their appearance. It very rarely surrounds the body entirely, but sometimes passes upwards across the shoulders like a sword-belt. Pliny says the disease proves fatal when the eruption extends until it encircles the trunk of the body entirely. This assertion is, no doubt, incorrect, but the same idea still prevails as a popular error in many European countries. It is not dangerous, though often painful; and as long as feverish symptoms are present the diet should be mild, consisting principally of farinaceous articles, as sago, arrow-root, rice, or bread-pudding, &c. It is not contagious. Equal quantities of laudanum and tepid water are used to wash the parts affected, to relieve the smarting and tingling sensation.

Dry Pimples. The papular* group of eruptions, or dry pimples, are remarkable for the high degree of cutaneous irritation which they create, and hence are very annoying companions, and likely to be turned into disagreeable and painful sores by attempts made to relieve the itching. They are common in infants and young children, and in them are known by the popular terms of red-gum, red-gown, and tooth-rash. In adults they are technically termed lichen; and another less distinct form, in which the eruption is only appreciable to the touch, though always distinguishable by the marks of the nails, is denominated prurigo, on account of its excessive itching. In the red-gown and tooth-rash of infants, the pimples are sometimes paler than the surrounding skin, and in one variety are almost white. They are always accompanied by more or less of feverishness, and indicate irritation in the gums from the growth of the teeth, or in the alimentary canal. Lichen exhibits great variety in its outward characters in different individuals; in one, the pimples are bright red; in another, of debilitated constitution, they are bluish and livid; in a third, they are developed around the base of hairs; in a fourth, they appear as circular groups, and increase by their circumference, while they fade in the centre, forming so many rings of various sizes; in a fifth, a modification of the preceding, they have the appearance of flexuous bands; while, in a sixth, they are remarkable for producing intensity of suffering, or unusual disorganisation of the skin. They are all occasioned by constitutional disturbance, sometimes referable to the digestive, and sometimes to the nervous system.* The ant-bite (prurigo) is a severer form of the same disease, and is so called from its giving the sensation of the flesh being devoured by myriads of ants. It is peculiar to elderly persons. Plato, Charles the Fifth, and Charles the Ninth of France, died of it. For itching of the skin, both in the infant and in the adult, the best ~~remedy is~~ the juice of a lemon squeezed into a pint or half-pint of pure water, and used as a lotion. Some persons use distilled vinegar, and vinegar and water: for an infant of course the remedy must be more diluted than for an adult. A spare diet and frequent bathing will be found very beneficial. Watery pimples vary much in size; they are sometimes scarcely visible to the naked eye, and occasionally attain the size of a hen's egg. When they are small they are very abundant; but when large are few in number. When the small vesicles are clustered together, they are known by the term *eczema*; but when they are the size of a small pea, they are termed *herpes*; if larger, they are named *rupia*, and when they assume the bulk of blisters they are termed *pemphigus*. When the eruption is attended with a watery discharge, and a thick crust, it is termed "humid tetter," and when it attacks the scalp, and occasions a loss of hair, it is called *scald head*. When it breaks out on or about the lips, as is frequently the case from a cold, it is designated *herpes labialis*. If the eruption begins with a small circular spot, which spreads by the circumference, while it gradually disappears at the centre, it is known as *vesicular ring-worm*; and when it occurs in patches, with a tendency to follow a circular direction, it is the shingles—a disease already described.

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* Papula, a pimple.

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* E. Wilson on "Healthy Skin."

Ring-worm, or scald head, is decidedly contagious, and occurs chiefly to children. In illustration of which I may relate the following case, as told by Dr. Elliotson:—"A barber had a child with a scald head, and he kept a razor especially for shaving it. One day, by mistake, he shaved himself with it; and although he had washed and strapped the razor well, and had put it into hot water first, yet the disease came out upon his chin about a week afterwards. I saw it distinctly. Small circular pustules came out. You must strongly impress upon the minds of people the necessity of a child's dress being kept isolated in this affection, lest the disease should spread."

Ring-worm may originate spontaneously in children of delicate constitution, who are badly fed, and uncleanly. The head ought to be first shaved, or the hair cut as close as possible. If the shaving, by the spread of the disease, has become difficult, the head should be well washed with soap and warm water, and bread or linseed poultices should be well applied. After this, the affected parts may require anointing night and morning with a suitable ointment.

Warts. Excrescences on the skin, as warts and corns, are owing to an unnatural enlargement of the papillæ, and the size of the wart in height depends upon the height of the enlarged papillæ, and the number of them. A single diseased papilla would form a very small wart; but a numerous cluster would form a very large one. Thus a large wart is a bundle of smaller warts—the number of the latter representing the number of the papillæ. The cause of warts is stated by Erasmus Wilson to be unknown, though he deems it probable, from their more frequent occurrence in schoolboys, to arise from *dirt*, though they may be occasioned by external irritation. The supposition of the blood which flows from a wart causing the growth of other warts is unfounded. Dr. Jenner observed that persons employed in milking cows were particularly liable to them. Some persons are much more liable to them than others. Soft warts may be readily destroyed by applying the tincture of steel to them, or by anointing them daily with mercurial ointment. The best method of removing hard warts is to cut them off with a knife or scissors, and then apply caustic to destroy their roots. They may also be destroyed by touching them repeatedly with lunar caustic, blue vitriol, or nitric acid; or they may be effectually removed by the application of chloride of zinc. A wart with a narrow neck may be easily got rid of by fastening round it a silk thread or horse-hair. After it drops off, the root should be touched with caustic, to prevent its growing again.

Corns, like warts, depend upon the increase of growth of the papillæ produced by long-continued and unequal pressure. They consist at first of thickened cuticle or scarf-skin, which for some time gives little uneasiness, but when the pressure of the boots or shoes is kept up, a conical-shaped root is formed, having a sharp point, which pierces deeply, and ultimately occasions acute pain. A corn is of itself inorganic and insensible, the pain which it occasions being in the surrounding parts, which in warm weather become unusually red, distended, and tender to the touch; and in moist or rainy weather the pain is augmented, in consequence of the corn being enlarged from absorption of moisture, thereby causing it to press with increased force on the part underneath. The first method of curing corns is to remove the cause by substituting larger or more easy boots or shoes, taking care that the upper leather of the boot is soft and sufficiently yielding to the movement of the foot, so as to prevent the slightest pressure on the part affected. This, and frequently paring them, will often remove them. The summit of the corn should be cut in such a way as to excavate it, the edges being left to act as a bolster and still further protect the central part, where the longest, and consequently the most sensitive papillæ are found, and if adroitly performed the centre may be worked round so as to take out the fibrous portion in a single piece. This may be performed without giving the least pain. The cavity should be then filled with a little simple ointment, and the part covered with adhesive plaister. Corns, like warts, may be also destroyed by means of lunar caustic. The corn is first to be cut away as much as possible without making it bleed; the foot is then to be kept in warm water during a quarter of an hour or twenty minutes, and, after drying it properly, the lunar caustic is to be applied over the surface of the corn, but not too freely used. The part is then to be covered with adhesive plaister, and at the expiration of ten days or a fortnight the dead scarf-skin generally comes away with the corn attached to it. A few hours' rest is necessary after the caustic has been employed, hence the most convenient time to apply it is immediately before going to bed. Sir Benjamin Brodie is of opinion that concentrated nitric acid, or strong aqua fortis, is the best thing for destroying the soft corns, which are usually situated between the toes: it is to be applied by means of a probe, with a bit of lint attached to the end, and so managed as to penetrate into the substance of the corn without injuring the parts beneath.

Bunyons. Those who are troubled with bunyons are generally those who have the great toes turned outwards, and the little toes inwards, to an unnatural extent. A bunyon is a swelling on the inside of the first joint or ball of the great toe, caused by the pressure of tight boots or shoes, whereby the toes are squeezed against each other and kept in an improper position. The treatment in this case is, to remove the cause and employ warm linseed poultices, and warm fomentations, with the application of leeches, to the surrounding parts.

Burns and Scalds. In all cases of burns or scalds, the first object should be to exclude the air from the injured part, as effectually as possible. For this purpose, flour, or cotton wool, should be immediately used; this covering will alleviate the pain of the patients. Flour is the better remedy of the two. Before employing cotton, it is advisable to immerse the parts in cold water, or, if their situation will not admit of it, to apply pieces of fine linen dipped in cold water, or vinegar and water, and wetted frequently during several hours, or until the pain and heat are removed. The cotton employed should be finely carded out, and then applied over the burned surface in thin layers, one over the other, until there is a covering sufficiently thick to exclude the air. Bandages are then to be applied over the whole of this envelope, so as to keep up a moderate and equal degree of pressure. The best way to apply the flour is with a kitchen dredger; the flour should be renewed without disturbing that portion which adheres to the surface. When circumstances require the flour to be removed, the injured parts should be covered with large warm poultices, which will allow the hardened coatings to come away easily. After a burn of the worst description, the patient complains of being cold, and shivering comes on, and if the pain is very great he falls into a stupor, or insensibility, which, if reaction does not take place, continues until death. This state of insensibility seems wisely ordained to prevent the extreme suffering which would otherwise be the fate of the unfortunate person.

Freckles. Erasmus Wilson recommends, as the best local application for freckles, a cerate of elder flower ointment and sulphate of zinc, to be rubbed well into the skin at night. In the morning this is to be washed away with abundance of soap, so as to secure the entire removal of the grease, and a lotion is then to be applied: infusion of roses and citric acid.

Moles. "The only safe and certain mode of getting rid of moles is a surgical operation." Now, by the use of certain kinds of soaps which modern chemistry has prepared for the purpose, many of these diseases of the skin can be eradicated — certainly, many of them may be prevented. All authors agree on one point — that the greater part of the cutaneous diseases are produced by uncleanliness, though there are many, as we have stated, which arise from other causes. The necessity of keeping the pores of the skin open, so as not to impede perspiration (so indispensable to health) is indisputable. The great utility of the pores of the skin may be learnt from the experiments of M. Fourcault, who ascertained that an animal whose body was covered with an impervious glaze or varnish, in every instance suffered a notable derangement of health; and, if the application were tolerably complete, that it perished after the lapse of a few hours, or of several days. A polished plate of metal brought against the surface of the skin in the most dry and burning state of a fever, is rendered dim by its exhalations.

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CHAPTER IV.

GREEK AND ROMAN BATHS.

THIS age has developed a new function of the skin. It has become the great agent of operations with a new class of hydropaths. Priessnitz has superseded Galen. Washings, bathings, and liquid applications to the skin, are now extensively, and it would seem to a great extent successfully, employed for the cure of diseases the most difficult to cure. Pleasure first sent men into the water; intelligence sends them into it now. Laving was first a luxury; it is now a system; and the ascertainment of the kind of lavements to be used in special cases is becoming a question of interest and importance.

Originally, bathing undoubtedly took place in the rivers and the sea, but men soon learned to enjoy the pleasure in their own houses. Homer mentions the use of the bath as an old custom. When Ulysses enters the palace of Circe, a bath is prepared for him, after which he is anointed with costly perfumes and dressed in rich garments. The bath, at this period, was the first refreshment offered to the guest. In later times, rooms, both public and private, were built expressly for the purpose of bathing. The public baths of the Greeks were mostly connected with the gymnasia, because they were taken immediately after the athletic exercises. The Romans, in the period of their luxury, imitated the Greeks in this point, and built magnificent baths.

The following description applies both to the Greek and Roman baths. The building which contained them was oblong, and had two divisions, the one for males, and the other for females. In both, warm or cold baths could be taken. The warm baths, in both divisions, were adjacent to each other, for the sake of being easily heated. In the midst of the building, on the ground-floor, was the heating-room, by which not only the water for bathing, but sometimes also the floors of the adjacent rooms were warmed. Above the heating-room was an apartment in which three copper kettles were walled in one above another, so that the lowest (calidarium) was immediately over the fire; the second (tepidarium) over the first, and the third (frigidarium) over the second. In this way, either boiling, lukewarm, or cold water could be obtained. A constant communication was maintained between these vessels, so that as fast as the hot water was drawn off from the calidarium, the void was supplied from the tepidarium, which being already considerably heated, did but slightly reduce the temperature of the hotter boiler. The tepidarium, in its turn, was supplied from the piscina or frigidarium, and that from the aqueduct; so that the heat which was not taken up by the first boiler passed on to the second; and, instead of being wasted, did its office in preparing the contents of the second for the higher temperature which it was to obtain in the first. The terms frigidarium, tepidarium, and calidarium, are applied to the apartments in which the cold, tepid, and hot baths are placed, as well as to those vessels in which the operation of heating the water is carried on. The coppers and reservoir were elevated considerably above the baths to cause the water to flow more rapidly into them. The bathing-rooms had in the floor a basin of mason work, in which there were seats, and around it a gallery, where the bathers remained before they descended into the bath, and where all the attendants were. Persons going to bathe first entered the frigidarium; they then went into the tepidarium, which prepared their bodies for the more intense heat which they were to undergo in the vapour or hot baths; while the process was reversed in going from the hot bath to the external air. A door-way led from the tepidarium into the calidarium. It had on one side the laconicum, where a vase for washing the hands and face was placed, called the labrum. On the opposite side of the room was the hot bath, called lavaerum. Vitruvius (v. 11) explains the structure of the apartment:—"Here should be placed the vaulted sweating-room (concamerata sudatio), twice the length of its width, which should have at each extremity on one end the laconicum, on the other end the hot bath." Vitruvius never mentions the laconicum as being separated from the vapour bath; it may, therefore, be presumed to have been always connected with it in his time, although in the thermæ constructed by the later emperors, it appears always to have formed a separate apartment. In the baths of Pompeii they are united, and adjoin the tepidarium, exactly agreeing with the descriptions of Vitruvius. The laconicum is a large semicircular niche, seven feet wide, and three feet six inches deep, in the middle of which was placed a vase or labrum. The ceiling was formed by a quarter of a sphere; it had on one side a circular opening, one foot six inches in diameter, over which, according to Vitruvius, a shield (clipeus) of bronze was suspended, which, by means of a chain attached to it, could be drawn over, or drawn aside from the aperture, and thus regulated the temperature of the bath. In the magnificent thermæ, erected by the emperors, edifices in which architectural magnificence appears to have been carried to its extreme point, not only was accommodation provided for hundreds of bathers at once, but spacious porticoes, rooms for athletic games, and playing at ball, and halls for the public lectures of philosophers and rhetoricians, were added one to another, to an extent which has caused them, by a strong figure, to be compared to provinces, and at an expense which could only have been supported by the inexhaustible treasures which Rome drew from a subject world. There were many of these establishments at Rome, built mostly by the emperors, for few private fortunes could suffice to so vast a charge. They were open to the public at first on the payment of the fourth part of an as (quadrans), which is less than a farthing. Agrippa bequeathed his gardens and baths to the Roman people, and assigned particular estates for their support, that the public might enjoy them gratuitously. The splendid edifice now known as the Pantheon, served as the vestibule to his baths. At a later period the bathers in some thermæ were supplied gratuitously even with unguents; probably it was so in all those built by the emperors. The chief were those of Agrippa, Nero, Titus, Domitian, Antoninus, Caracalla, and Dioclesian; but Ammianus Marcellinus reckons sixteen of them, and another author eighty. These edifices, differing, of course, in magnitude and splendour, and the details of their arrangement, were all constructed on a common plan. They stood among extensive gardens and walks, and often were surrounded by a portico. The main building contained extensive halls for swimming and bathing; others for conversation; others for various athletic and manly exercises; others for the declamation of poets, and the lectures of philosophers; in a word, for every species of polite and manly amusement. These noble rooms were lined and paved with marble, adorned with the most valuable columns, paintings, and statues, and furnished with collections of books, for the sake of the studious who resorted to them. On entering the thermæ, where there was always a great concourse of people, the bathers first proceeded to undress, when it was necessary to hire persons to guard their clothes: these the Romans called Capsarii. They next went to the unctuarium, where they were anointed all over with a coarse cheap oil before they began their exercise. Here the finer odoriferous ointments, which were used in coming out of the bath, were also kept, and the room was so situated as to receive a considerable degree of heat. This chamber of perfumes was quite full of pots, like an apothecary's shop; and those who wished to anoint and perfume the body received perfumes and unguents. * * * The elæothesium was filled with a vast number of vases. These vases contained perfumes and balsams, very different in their compositions, according to the different tastes of the persons who perfumed themselves. The rhodinum, one of those liquid perfumes, was composed of roses; the lirinum, of lily; cyprinum, of the flower of a tree called cypria, which is believed to be the same as the privet; baccarinum, from the fox-glove; myrrhinum was composed of myrrh. Perfumes were also made of the oil of sweet marjoram, called amaracinum; of lavender, called nardinum; of the wild vine, called œnanthinum. There was also cinamominum, made of cinnamon, the composition of which was very costly; oil made from the iris, called irinum; the balaninum, or oil of ben; the serpyllinum, wild thyme, with which they rubbed their eyebrows, hair, neck, and head; they rubbed their arms with the oil sisymbrium, or watermint; and their muscles with the oil of anarcum, or others which have been mentioned. Authors reckon up altogether above 800 baths built by the emperors of Rome with amazing magnificence. The chief, as we have said, were those of Agrippa, near the Pantheon; of Nero, of Titus, of Domitian, of Caracalla, of Antoninus, Dioclesian, &c. Of these, splendid vestiges still remain. The cold bath was in great repute after Antonius Musa recovered Augustus from a dangerous disease by the use of it, but fell into discredit after the death of Marcellus, which was occasioned by the injudicious application of the same remedy.* The Romans imitated the Greeks in building magnificent baths, and the buildings which contained them were on the same plan. Both were of an oblong form, and there were two divisions, the one for males and the other for females; and each had its warm and cold bath.

The Right Honourable W. E. Gladstone, in that wonderful book of his, "Studies on Homer and the Homeric Age," which the *Athenæum* (No. 1590) says is "almost a cathedral of thought and learning," describes the arrangements of a Prince's Household, as they appear from a view into Circe's dwelling, and which brings into view a curious employment of

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* Adam's "Roman Antiquities."

"young damsels of the highest ranks" in the bath-room in ancient times:—

"Circe has four male servants. The first provides the seats with the proper coverings; the second prepares and lays the tables; the third mixes the wine and brings the goblets; the fourth carries water, and lights the fire to boil it. The second passage exhibits to us the household of Ulysses at the break of day, when the in-door and out-door servants are setting about their morning duties. There were fifty women-servants. Of these, twelve were employed as flour grinders; and this appears to have been the most laborious employment among all those assigned to women. Eleven of the twelve have finished their task and retired to rest; the twelfth remains till the morning at her work, and curses the Suitors who cause her such fatigue. It is now dawn. Part of the maid-servants are lighting the fire. The old but active Euryclea is up betimes, and has the place of housekeeper. She desires a part of them to set smartly about sweeping the house and putting the proper covers on the furniture; another part are to wipe the tables and the cups; a third bevy, no fewer than twenty in number, are despatched for water. Meantime the men-servants of the Suitors have made their appearance, and they set about preparing logs for the fire. Then come in from the country the swineherd with his swine, the goatherd with his goats; and, from over the water, the cowherd with his cows, and with more goats. Taking the general evidence of the poems, it stands thus. Of agricultural operations, we find women sharing only in the lighter labours of the vintage; or perhaps acting as shepherdesses. The men plough, sow, reap, tend cattle, and live stock generally; they hunt and they fish, and they carry to the farm the manure that is accumulated about the house. Within doors, the women seem to have the whole duty in their hands, except the preparation of fire-wood and of animal food. The men kill, cut up, dress, and carve the animals that are to be eaten. The women, on the other hand, spin, weave, wash the clothes, clean the house, grind the corn, bake the bread and serve it, with all the vegetable or mixed food, or what may be called made dishes. They also prepare the table, and hand the ewer with the basin for washing. And a portion of them act as immediate attendants to the mistress of the palace, Andromache, Penelope, or Helen. Thus far all is easy and becoming; but an apparent difficulty confronts us when we find that it was the usage for women to undertake certain duties connected with the bathing of men. Sometimes this was done by servants; thus it was managed for Telemachus and Pisistratus in the palace of Menelaus, and for Ulysses in that of the Phæacian king. On the other hand, it was sometimes an office of hospitality rendered by women, and even by young damsels, of the highest rank, to distinguished strangers of their own age, or otherwise. Polycaste, the young and fair daughter of Nestor (as the text is commonly interpreted), bathed and anointed Telemachus, and put on him a cloak and vest."

This usage is not unlike what Mr. Bayard Taylor noted in Norway, though Mr. Gladstone endeavours to explain away the immodesty or duplicity of the Homeric custom.

CHAPTER V.

ANCIENT ANOINTING.

An amusing story relative to this practice of anointing is related by Spartianus :—" The emperor Hadrian, who went to the public baths and bathed with the common people, seeing one day a veteran whom he had formerly known among the Roman troops, rubbing his back and other parts of his body against the marble, asked him why he did so? The veteran answered, that he had no slave to rub him, whereupon the emperor gave him two slaves, and wherewithal to maintain them. Another day several old men, enticed by the good fortune of the veteran, rubbed themselves also against the marble before the emperor, believing by this means to excite the liberality of Hadrian, who, perceiving their drift, caused them to rub each other."

When the Roman bathers passed into the sphæristerium, a very light and extensive apartment, there were performed the many kinds of exercises to which this third part of the baths was appropriated; of these, the most favourite was the ball. When its situation permitted, this apartment was exposed to the afternoon sun, otherwise it was supplied with heat from the furnace. After they had taken what degree of exercise they thought necessary, they went immediately to the adjoining warm bath, wherein they sat and washed themselves. The seat was below the surface of the water, and upon it they used to scrape themselves with instruments called strigiles, most usually of bronze, but sometimes of iron; or this operation was performed by an attendant slave, much in the way that ostlers treat horses when they come in hot. Young slaves then came out of the alæothesium, carrying with them little vases of alabaster, bronze, and terra-cotta, full of perfumed oils, with which they anointed the bathers, by causing the oil to be slightly rubbed over every part, even to the soles of their feet. It is probable that the Romans resorted to the thermæ for the purpose of bathing, at the same time of the day that others were accustomed to make use of their private baths. This was generally from two o'clock in the afternoon till the dusk of the evening, at which time the baths were shut till two the next day. This practice, however, varied at different times. Notice was given when the baths were ready by ringing a bell; the people then left the exercise of the sphæristerium and hastened to the caldarium, lest the water should cool. But when bathing became more universal among the Romans, this part of the day was insufficient, and they gradually exceeded the hours that had been allotted for this purpose. Between two and three in the afternoon was, however, the most eligible time for the exercises of the palæstra and the use of the baths. It must be understood that we are now speaking of the days about the equinoxes, for as the Romans divided their day, from sunrise to sunset, into twelve hours, at all seasons of the year, the hours of a summer's day were longer, and those of a winter's day shorter, than the mean length, continually varying, as the sun approached to or receded from the solstice. Hadrian forbade any one but those who were sick to enter the public baths before two o'clock. The thermæ were by few emperors allowed to be continued open so late as five in the evening. Martial says that after four o'clock they demanded a hundred quadrantes of those who bathed. This, though a hundred times the usual price, only amounted to about nineteenpence. We learn from the same author, that the baths were opened sometimes earlier than two o'clock. He says that Nero's baths were exceedingly hot at twelve o'clock, and the steam of the water immoderate. Alexander Severus, to gratify the people in their passion for bathing, not only suffered the thermæ to be open before break of day, which had never been permitted before, but also furnished the lamps with oil for the convenience of the people. From this time it appears that the Romans continued equally attached to the practice of bathing until the removal of the seat of the empire to Constantinople, after which we have no account of any new thermæ being built, and may suppose that most of those which were then frequented in the city of Rome, for want of the Imperial patronage, gradually fell into decay. It may likewise be remarked, that the use of linen became every day more general; that great disorders were committed in the baths, a proper care and attention in the management of them not being kept up; and that the aqueducts by which they were supplied with water were many of them ruined in the frequent invasions and inroads of the barbarous nations. All these causes greatly contributed to hasten the destruction of the baths.

Passalacqua discovered in the coffin of a remarkably well-preserved Egyptian female mummy a number of different articles for the toilet. This surprising specimen was wrapped in the ordinary linen bandages, but soaked with a balm which gave them a dark brownish red colour. The coffin was very simple, covered with different paintings of a religious import, and had not been varnished.* It enclosed the following:—

Under the head of the mummy, as if to support it, was placed a metallic mirror, which was a remarkably fine one. Near it was found a little box made of enamelled earth and ornamented with bas-reliefs; it enclosed a curious necklace, which consisted almost wholly of very small ivory rings, over which were beads of gold, lapis lazuli, and in it cornelian. Alongside the mummy were placed a kind of square wooden basin, which had probably been used by this ancient beauty to wash her face in with prepared water, and three little alabaster vases of different forms. One was furnished with a cover, containing a balm or perfume still liquid; another, also furnished with a lid and secured with linen, contained the antimony to stain the eyelashes, which could still be seen inside the vase, and the use of which is proved by the present practice of female Copts in Egypt, and by a wooden instrument, rounded at one end, which he found in the same vessel. Another vase also appeared to have contained some perfume, but there were only feeble traces of it left. All these objects, as well as the mummy itself, were securely fastened together at the bottom of the coffin by a balm which had been poured over them. This was the cause of the alabaster of the three vases having the aforesaid peculiar colour, and which is not the character of that mineral.

The extreme beauty of this mummy, and its perfect preservation, so surprised the Arabs themselves that they exhumed it several times, although mutilated, to show it to their wives and neighbours.

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* Catalogue Raisonné et Historique des Antiquités descouvertes en Egypte, par M. Joseph Passalacqua, de Trieste, p. 159. Paris, 1826.

According to the Jewish dispensation, certain observances to insure personal cleanliness were the subject of religious injunction; and, for a similar reason, Mahommedans in Eastern countries have been enjoined to perform ablutions at stated times and seasons. In these Oriental countries, and also in Russia, the use of the warm bath is universal among the richer classes, and the public establishments for bathing are in some places on a scale of great magnificence. Probably, on account of Great Britain being a colder climate, the healthy practice of bathing has been much neglected here. We have already shown how superior the Greeks and Romans were in this respect. In their public baths the poorest citizens might lave. Baths in England, strange to say, though so easily procured, are considered a luxury. To the ancient Greeks and Romans they were necessaries, which they carried into their most distant provinces; and thus it is that in Britain the ruin of the Roman bath is as frequent as that of the Roman temple. We find throughout the vast empire of Russia, throughout all Finland, Lapland, Sweden, and Norway, that there is no cottage so poor, no hut so destitute, but it possesses its vapour bath, in which all its inhabitants, every Saturday at least, and every day in cases of sickness, experience comfort and salubrity. The exteriors of the Roman baths displayed the most sumptuous architectural skill and decoration. "In Russia they have only vapour baths, and these are for the most part in wretched wooden hovels. If wood is wanting, they are formed of mud, or scooped in the banks of rivers and lakes; but in the palaces of the nobles, however they may vary in convenience or splendour of materials, the plan of construction is always the same."* The pores of the skin, besides having a great exhaling power, also absorb air and moisture from the atmosphere, and when the pores are in a state of great openness, as after violent exercise or warm bathing, this power of absorption is considerably increased. Hence contagious diseases are more readily caught by touch when the body is warm and moist, than when dry and cold, and a cold bracing air is well known to be more conducive to health than one which is heavy and relaxing, and those who labour at an employment in which fumes and exhalations of deleterious kinds prevail, are injured and frequently killed by the absorption of poison through the skin, as well as by the lungs. Thus, house-painters, plumbers, and workers in certain oils, pigments, and metals, are liable to contract a disease well known by the name of the *painter's colic.* French and German workmen of every class, instead of wearing dirty corduroy or fustian clothes, are always attired while at work in neat, and generally very clean, blue or white blouses.

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* See Clarke's "Travels in Russia."

CHAPTER VI.

PERFUMES OF THE BATH.

THE hair of the Roman people of fashion was perfumed with various ointments, nard or spikenard, Malobathrum, Assyrium, Amomum, Balsamum ex Judæa. Many of the Roman customs relative to the bath were borrowed from the Greeks. Before the Greeks went to an entertainment they washed and anointed themselves, for it was thought very indecent to go thither defiled with sweat and dust. They who came off a journey were washed and clothed with apparel suitable to the occasion, in the house of the entertainer, before they were admitted to the feast; thus we find in Homer, where he describes the reception of Telemachus, and Pisistratus by Menelaus:—

> "Thence to a bath, a beauteous pile, descend:
> Where a bright damsel train attend the guests,
> With liquid odours and embroider'd vests.
> Refresh'd, they wait them to the bower of state,
> Where, circled with his peers, Atrides sate."*

The same persons also washed their hands before they sat down to meat.

The ancient Greeks cleansed their hands between every course, and after supper, with the soft parts of the bread, which was afterwards thrown to the dogs.†

In washing, after supper, they used some sort of mixture to scour the hands, for which use nitre and hyssop are mentioned in the Scriptures; and lastly, the hands were perfumed with odours.

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* Pope.

† Potter's "Grecian Antiquities."

To wash is a means both to cleanse the body and refresh it; whenever, therefore, they ceased from sorrow and mourning, it was usual to bathe and anoint themselves; whence Eurynome, in Homer, advises Penelope to leave off lamenting:—

"Washing her body and anointing her face."

The ancient Greeks commonly bathed after the finishing a war, or any great fatigue.

Thus, in Homer, Telemachus and Pisistratus are bathed and anointed at the palace of Menelaus, after a long journey; Diomedes and Ulysses, after their return from discovering the manner of the enemies' encampment:—

"Having bathed and anointed, sat down to supper."

In the lyric age, men and women, without distinction, bathed themselves in rivers; this we find done by Nausicaa, the daughter of Alcinous, king of Phæacia, and Europa, in Moschus, cleanses her body in the mouth of the Anaurus. Helen, also, and her companions wash in the river Eurotas:—

"Her equals we in years, but not in face,
Our limbs diffusing with ambrosial oil,
Were wont on smooth Eurotas' banks to toil
In manly sports."*

The expressions in these verses are manifestly accommodated to the institutions of Lycurgus, by which the virgins were obliged to bathe, and accustom themselves to such exercises as in that age were only practised by men; hence the poet observes that it was done "after the manner of men," which would have been a very improper expression in heroic times, when it was customary for both sexes to use this diversion alike.

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* Fawkes.

But if the sea were within a convenient distance, they commonly bathed in it rather than in the rivers, the salt being thought conducive to the strengthening of the nerves by drying up superfluous humours; thus Diomedes and Ulysses, in Homer, after very great fatigue, "went into the sea to cleanse themselves from sweat;" and they who lived far from the sea travelled thither. Of this we find an example in Minutius Felix, by one of the persons in whose dialogue it is resolved, "to go to the most pleasant city Ostia, in order to enjoy the benefit of bathing in the sea, which is an easy and expeditious method of drying up the superfluous humours of the body."

Hot baths are also very ancient. The hot baths showed by Vulcan, or, as others say, by Minerva, to Hercules, at a time when he had undergone a very great fatigue, are celebrated by the poets. Pindar speaks of the hot baths of the nymphs. Homer commends one of the fountains of Scamander for its hot water. In the Iliad, Andromache provides a hot bath for Hector against his return from battle. Nestor, in the eleventh book, orders Hecamede to make ready a hot bath; and the Phæacians are said, in Homer's Odyssey, to place their chief delight in "changes of apparel, hot baths, and beds." Yet hot baths do not seem to have been then so much used as in later years.

According to Artemidorus baths (probably hot baths only) seem to have been thought hurtful by the ancients, and were only used after great fatigue. The Greeks had no baths like those of later times, but washed in certain vessels, which in

Greek signify a large basin, or vessel to wash in, and the term itself is derived from words signifying the taking away of the filth of the body. The ancient Romans had a vessel in their own houses in which they washed, called lavatrina, or latrina, which was afterwards termed balseum. Public baths were unknown till later times. Athenæus tells that in his age they were but lately come into use, and that formerly no such places were allowed to be in the city.

The baths commonly contained the following rooms:—

1. One in which they put off their clothes. 2. The sweating room, most commonly round, for the benefit of those who desired to sweat. 3. A hot bath. 4. The room in which they were anointed. The sweating room was provided with fire, so contrived that it should not smoke.

After bathing they always anointed, either to close the pores of the body, which was considered necessary after the use of hot baths, or to prevent the skin from becoming rough after the water was dried off of it. If we may believe Pliny, they had no better ointment in the time of the Trojan war than oil perfumed with odoriferous herbs, especially with roses; whence oil mixed with roses is mentioned in the twenty-third book of the Iliad, where Venus anoints the body of Hector, and to the same ointments he also alludes when speaking of Juno:—

> "Her beauteous body, with ambrosial lymph,
> Then polished it with richest oil divine
> Of boundless fragrance."*

But Athenæus is of opinion, that Homer was acquainted with the use of more precious ointments, but calls them oil, with the addition of an epithet to distinguish them from common oil. The same observation is made by the commentators of that poet, when they explain those words which in Greek signify "perfumed oil," and it is well known that the Jews called all sorts of ointment by the name of oil; the reason seems to have been that oil was the first ointment; however, the ancient heroes never used costly ointments. Athenæus himself acknowledges that Homer never introduces any of his heroes anointed with any ointment besides oil, except Paris, a soft and effeminate person. In more delicate ages when very much of the primitive plainness was laid aside, it was still thought indecent by many for men to anoint themselves with precious ointments. The Greek word *muron*, costly ointment, was derived "from the vain and unprofitable labour of compounding it." And Socrates was of opinion that the smell, as well as the garments of men and women, ought to be different; that for women it was decent enough to smell of perfumed ointments, but that men should rather smell of oil, which was used in the schools of exercise. Solon prohibited men from selling ointments, and the laws of Sparta entirely forbade their sale altogether; nevertheless, women, and some effeminate men, were so curious in their choice of ointments, that they could tell very creditably what sort best suited each member of the body. An example of this may be found in certain verses of Antiphanes, which are cited by Athenæus.

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* Cowper.

The feet being most exposed to dust and filth, were oftener washed and anointed than the other parts of the body, on which account they are by some thought to be called Liparoi podes in Homer. Women were generally employed to wash and anoint the feet, both in the heroic and later ages; it was customary for them to kiss the feet of those to whom they thought a more than common respect was due; thus the woman in the Gospel kisses the feet of Christ while she anointed them. The same ceremony was performed towards Philoleon by his daughter, as himself relates in Aristophanes.*

Nitre and hyssop were used in lieu of soap,† both by the Greeks and Hebrews; and the latter, when burnt along with the flesh of the red heifer, denoted purity.‡ Previous to the invention of soap, the ancients cleaned their clothes by rubbing or stamping upon them in water. At a later period a lye of ashes was employed, which is mentioned under the name of "konia" by Aristophanes and Plato, and with which they washed the images of their gods. The Jews used an alkali either derived from a natural alkaline water, or from a plant similar to sopewort, under the name of Borith.

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* Potter's "Grecian Antiquities."
† Brown's "Dict. of the Bible." Art.—Nitre
‡ See Leviticus, xiv. 4, 52.

CHAPTER VII.

IMPORTANCE OF PERSPIRATION. HYDROPATHIC AND MEDICATED BATHS.

CONSIDERING the very important part played by the skin, in relation to the animal economy, and the consequent necessity of preserving its functions in their integrity, it is surprising that the perfect system of Baths existing during the palmy days of the Greek and Roman Empires, should, upon the decline of those Empires, have fallen into nearly total disuse; and in spite of the advancements in medical and anatomical science among modern nations, that the custom of frequently cleansing the skin, followed by the ancients for luxury, should not have been continued from a knowledge of its necessity.

It has been seen in a former chapter of this work, that the skin of an average-sized man contains seven millions of pores, with corresponding ducts; if, then, this immense depurating surface is necessary for the conveying from the body those morbific humours which are continually being eliminated from the various organs, it may be reasonably inferred that an obstruction of this function will be followed by results more or less disastrous, according to its extent. Whether this principle was understood by the ancients is a matter for speculation, certain it is that they must have experienced great delight in the performance of their ablutions; and that it was conducive to health is as certain, for they not only excelled in gymnastic exercises, that would put our modern professors to the blush;

but diseases, more especially of the skin, were comparatively few.

Even among the rudest nations the necessity of periodically cleansing the skin was acknowledged; and the process of perspiration was almost universally adopted for this purpose, and effected by means of hot air, or the vapour of hot water. Vapour baths were in common use among the savage tribes of America; and in Russia the same custom has prevailed from time immemorial, nor has it fallen into disease. In Turkey the hot air bath is as familiar to the poor as to the rich; and even in Ireland may be seen the vestiges of hot air baths; and in some remote parts of that country, far removed from the populous towns, the custom is still followed.

The pursuit of Mammon has ever been an all-engrossing labour of man, and to such an extent has his mind been engaged in this object, that in modern times he has been content to leave his body entirely to the care of the doctor, without knowing, or caring to know, how much of Mammon he might save by simply attending to the proper performance of the functions of the skin. Had the reverse of this been the case, it is highly probable that many of the skin diseases, both contagious, and non-contagious, now so common, would never have had an existence; indeed, it would not be too much to assert, supposing the custom of frequent ablution of the whole body to be universal among the inhabitants of our great cities and towns, that the dreadful disease consumption, which now annually carries off, in Great Britain alone, upwards of sixty thousand souls, would be modified to a very great extent; for colds very rarely occur when the skin is in healthy condition;

and it is from colds that in numerous instances consumption arises.

It is a fact patent to the medical profession, that in nearly all cases of inflammatory disease, the most favourable symptom is the appearance of perspiration upon the surface. In all ages this appearance has been termed the "crisis," and a favourable diagnosis is generally given upon it; yet, strange to say, up to within a few years the means for bringing about such a result—viz., bleeding, blistering, and antimony, were the antique and favourite remedies, even though years of experience proved the evil of depletive measures in inflammation.

There exists in the body a power of reaction, manifesting itself through the medium of the skin, which, more especially in inflammatory affections, will develop itself, even under circumstances which at first sight appear suicidal.

Dr. Gregory relates that a gentleman, during the delirium of a typhus fever, escaped by the window, his bedroom being on the ground-floor, then plunged into the river flowing at the bottom of his garden, swam across and climbed up the opposite bank. The sudden shock of cold water, with the exertion of swimming across the stream, and scrambling up the bank, restored him to his senses. Sensible of his situation—in the middle of the meadow and his return intercepted—he was obliged to recross the river in the same way, and having regained his chamber, got into bed, fell into a profound sleep, with a profuse perspiration, and, several hours afterwards, awoke, perfectly free from the fever.

Dr. Willis, in his treatise on Phrenitis, gives an instance in which a girl was cured of this disorder by a profuse perspiration, obtained through extraordinary means. "Some time ago," says the Doctor, "I was called to attend a robust and vigorous servant maid, who, being seized with a fever, became so furious and mad, that it became necessary to keep her continually bound in bed. I took a large quantity of blood from her at different times, prescribed the usual remedies in such cases, with the addition of juleps, emulsions, and opiates. But all these were of little or no service; she remained without sleep, and raving mad, for the space of seven or eight days, crying and roaring incessantly for some cool fluid to drink;—for which reason she was allowed as much water as she pleased;—but was neither rendered more calm nor less thirsty by that means. As it was the summer time, I ordered her to be taken up in the middle of the night by women, and carried to a boat, where her clothes being taken off, and the cords with which she was bound untied, she was plunged into a deep river, having previously tied a rope about the trunk of her body lest she should happen to be drowned. But there was no occasion for this expedient, for the girl could naturally swim with so much dexterity that a man, expert in that exercise, could have scarce acted his part better. About fifteen or twenty minutes after, she was taken out of the water sober, and in her senses. Upon which, being laid in bed, she slept, fell into a profuse sweat, and was thoroughly recovered without the use of any other remedy whatever."

Sir John Floyer relates a case of a farmer's wife, residing at a village, about four miles from Lichfield, who was ill of a fever, attended with delirium and an utter privation of sleep. It happened one night that the patient lay for a time very still, and the nurse took that opportunity of leaving the room to fetch something she wanted. When she returned she found all still and quiet, and sat down by the bedside for at least a quarter of an hour, but observing that she did not hear the woman breathe, she put back the curtains suspecting she was dead, but was much surprised to find she was not in bed. After searching the room to no purpose, she alarmed the people in the house, who, after searching for some time, found the woman in the well, at the back of the house, up to her chin in water. She was instantly taken out and put to bed, and immediately fell asleep. Soon after a profuse sweat broke out, which continued for many hours. She awoke without any delirium, and recovered without any further trouble.

In all these cases, the recuperative power of the body is beautifully shown, and the importance of perspiration manifested; and as it would be unadvisable to use the same means in all cases of fever and inflammation, it is satisfactory to know that the same end can be obtained by rational and more agreeable means.

The following methods of bathing are in daily use at the establishments of Priesnittz in Graefenberg, and all have for their object either the drawing of the morbid humours of the body to one particular part, and there discharging them, or effecting the same by means of perspiration.

"*Abreibungen*"—rubbing the body with a sheet dripping wet. This mode of applying cold water to the skin is more or less used by Priesnittz in almost every instance, and is considered of especial service in cases of nervous debility and weak constitution. It admits of frequent repetition, and is of great use when the body is hot and feverish. When there is a determination of blood to the head, the head and face are washed with cold water previous to the application of the wet sheet. When the debility is so great that reaction does not take place —that is, when the patient does not feel a warm glow, but remains cold, he is put to bed for half-an-hour, and well covered up, then when thoroughly warmed, he must get up and have the operation immediately repeated, and then dress quickly and take a good walk, whatever may be the state of the weather, and during the walk drink several glasses of cold water. A glass of water must also be drank either immediately before, during, or after the application of the sheet, according to the inclination of the patient. Six of these applications are often used in the course of the day, even to the most feeble constitutions. This remedy is also used for such as do not become warm whilst enveloped in the moist or humid sheet. It may, moreover, be used immediately after dinner, and with much advantage when the body is covered with perspiration from exercise. After it is thus freed from perspiration, and a reaction has taken place, the patient is placed in the "*lientuch,*" or moist sheet, if the case requires it. But if the patient perspires greatly from debility, or any such cause, either during the day or night, these perspirations should always be arrested, not by the "*lientuch,*" but by the "*abreibungen.*"

"*Nasse Lientuchen*"—the moist or humid sheet. This remedy is applied in the following manner:—A sheet is dipped into cold water, and wrung out until no more water will drip from it. A blanket is then spread upon a palliasse or hair mattress, and the sheet placed upon it. Upon this the patient lies down upon his back, with it folded loosely around him. The blanket is then drawn over on one side and well tucked in, making a plait or fold about the hips so that it may lie closely; afterwards it is drawn over on the other side as tight as possible, and very carefully tucked in, especially about the neck and shoulders, so that no steam or vapour can escape. The legs are then raised, and the bath man turns the end of the blanket under the feet. A light down bed is placed above, with a coverlet or couple of sheets over it, and the whole is well secured. This mode of applying cold water to the surface of the body is resorted to as well as the preceding one, in almost every case preparatory to the sweating process, the plunging bath, and the "*douche*" bath. It is said to be of great efficacy when the skin does not perform its functions from being either harsh and dry, or dry and cold, or dry and hot as in fever. In the latter case it may be repeated twenty times during the day, until the skin is cooled and perspiration ensues. In such cases where the patient becomes quickly hot again, the sheet should be changed for another, in which he may remain half-an-hour or longer. After the application of this remedy, should the patient be sufficiently strong, friction with water, either cold or at the temperature of 50 or 60 degrees Fahrenheit, may be used. But when there is much debility, friction with the wet sheet, as before observed, must be had recourse to, instead of the half-bath. The moist sheet is generally used for an hour, three times a-day, and when the patient can bear it, this is followed by the cold bath. To strengthen or brace the system, the moist sheet is used only for a short time, merely until the patient becomes warm, when it is changed for another;

and this is repeated three or four times in the course of an hour.

"*Kotzen-Schweitzen*"—sweating in a blanket. In this process the blanket is applied to the patient precisely in the same manner as when it is used with the humid sheet, being tightly folded around him, especially about the neck and shoulders. When the constitution is robust, the patient, after undergoing this process, and having perspired freely for from half-an-hour to two hours, according to circumstances, he either plunges into the cold bath, having previously washed his face and breast, and remains in it until he experiences a sensation of cold or slight shivering; or else he is well rubbed in the demi-bath, with cold or tepid water, until a glow is produced on the skin. In either case he is to drink a glass of cold water immediately afterwards, dress speedily and take a walk, repeating his draught of cold water as often as is convenient. The general rule is to drink as soon as reaction takes place, and the circulation fully established.

"*Umshlag*"—wet bandages. These are of two descriptions; the one heating so as to produce the effects of a warm fomentation, and the other a cooling bandage. The first consists of a linen cloth, merely moistened with cold water, which, when thoroughly wrung out, is closely folded either round the part affected, or where it is desired to produce cuticular irritation, and a metastasis of the disease. This wet bandage is to be well covered with a dry one, and kept constantly applied to the part, and renewed three or four times a-day, or as often as it becomes either dry or disagreeably hot. The second, or cooling bandage, is simply a wet cloth almost dripping, loosely thrown over the diseased part, without any dry covering, so that evaporation may freely take place. This is applied to all external injuries. A cut or wound is first bound up with a dry rag, and then the evaporating process used over it, as recommended by Vander Heyden in cases of broken skin; but if the wound be extensive or the inflammation intense, then a part, at some distance from the wound, is bathed with cold water; as for example, if the hand is wounded, the elbow is bathed. A burn is treated in the same manner. When the inflammation has disappeared, the bandage is not to be removed, but, from time to time, moistened when dry, and continued until there is reason to believe that the wound is perfectly healed. The action of the "*umshlag*" is to draw the morbid matter to the surface—and this at Graefenberg is known as the "crisis;" therefore in all cases where pain exists it is applied, when it either produces a "crisis," or soothes the pain without one. This remedy forms a most important part of the hydropathic treatment.

"*Halb-bad*"—friction with water in the half bath. This operation is performed upon the patient whilst seated in an oblong tub, containing from eight to fourteen inches depth of water, generally about 55 or 60 degrees Fahrenheit. The mode of application is by taking water in the palms of the hands, pouring it on the different parts of the body, and rubbing them at the same time. In this the patient is required to assist, to rub his stomach, legs, and arms, whilst the attendant strenuously operates in the same way on his back and sides, and especially on any part that is particularly affected. Water is first poured on the head and face, and repeated from time to time. This bath is much in use, forming a portion of the preliminary treatment in nearly all cases. It is sometimes continued only for two or three minutes, merely to wash and refresh the body; at others, it varies from that to half-an-hour, or even a longer period, care being taken that sufficient friction is used to produce a reaction, so that the patient may experience a sensation of warmth. This remedy is applied after the moist sheet, and frequently after sweating in a blanket, and is considered very effective in opening the pores of the skin.

"*Sitzbad*"—Hip Bath. This bath is formed of a small round tub with a high back, and just large enough to receive the patient in a sitting posture. The water is generally used cold. This remedy is followed by friction with the wet sheet, and is in constant use. It is generally taken twice a-day, and is considered powerfully derivative and very useful in headache, dyspepsia, and nervous irritability. The patient commonly remains in it for ten minutes, using friction the whole of the time.

The "*Douche*," or Cataract Bath. This bath is constructed on the declivity of a hill, and is supplied from a natural current of water so directed as to pass along some wooden troughs supported on stays, to give them the required elevation. These troughs are contracted towards their extremities, so that the water may fall on the patient in a round compact stream, from a height of ten or twenty feet. The stream varies in thickness from the size of the wrist to that of the arm, and descends with considerable weight and force. This remedy is said to fortify and greatly excite the system, and is considered at Graefenberg most effective in expelling the latent diseases which exist in the body. At first, it is ordered to be taken for one minute, which in summer is gradually increased to five or six, according to the constitution of the patient; but in winter its application rarely exceeds two minutes.

The "Douche" is never allowed to fall on the head. On first entering the bath the hands are held up to break the stream of water, and thus form it into a shower bath; neither is the stream suffered to fall perpendicularly upon the stomach or abdomen, as in that case it would be apt to excite vomiting, besides producing other bad effects. After the "Douche," the patient is thoroughly rubbed with a dry sheet, and directed to take brisk exercise in the open air, so that the reaction may completely take place, and the circulation be fully restored. A glass of cold water is drunk both before and after this bath.

Wannen-bad—Plunging-bath. This bath is constructed of a large circular vat or tub, from five to fifteen feet in diameter, and four or five feet in depth, and is supplied with a constant stream of running water of the natural temperature. It is taken after sweating in a blanket, and is a modification of the Russian process of the vapour bath, with the after immersion in snow. The patient is ordered to dash some of the water on his head and breast, previously to getting into it, or, which is preferable, to plunge in headlong, and whilst in, he should put every muscle into action, rubbing himself and moving about. The time for remaining in is from one to five minutes, according to the sensations of the patient—that is, he should immediately get out on experiencing the first indications of a shiver. He is then rubbed down with a dry sheet; he then dresses, and takes a long walk, during which he drinks occasional tumblers of cold water.

The foregoing system, adopted by Priesnittz and others in Germany, is also carried out at several establishments here in England, and there can be no doubt that, combined as it is with strict attention to diet, a bracing atmosphere, and regular mode of living, it is eminently adapted for the cure of many forms of disease, which, without the latter advantages, the physicians of our large towns are unable to cope with. But we have here in London several establishments in which the system of medicated vapour baths is adopted with immense success, not only in the cure of diseases, but also as a prophylactic to disease.

The late justly celebrated Dr. Combe, in his work on Physiology, in speaking of the functions of the skin, and the importance of keeping it in good working order, introduces some remarks on the vapour bath, which are as follow:—

"The vapour bath is attended by the very best effects, particularly in chronic ailments, and there can be no question that its action is chiefly on the skin, and through that medium on the nervous system. As a means of determining to the surface, promoting cutaneous exhalation, and equalising the circulation, it is second to no remedy now in use. . . . . . . The prevalent fear of catching cold, which deters many from using the vapour bath, even more than from warm bathing, is founded on a false analogy between its effects and those of profuse perspiration from exercise or illness. The latter weakens the body, and by diminishing the power of reaction renders it susceptible of injury from sudden changes of temperature. But the effects of the vapour bath, properly administered, are very different; for, instead of exhausting the strength, it excites the vital action of the skin, and gives rise to a form of re-action, which enables it to resist cold better than before."

We have visited several private establishments in London, in one of which* the system of medicated vapour baths is brought nearly to perfection, and is under the immediate superintendence of the proprietor, Dr. Skelton, who has kindly furnished us with the following information respecting the system of bathing carried out at his establishment, and the properties and uses of the various baths.

Aqueous Vapour Bath.—Simple and Medicated. Properties and uses.—These baths administered at a temperature varying from 96 to 140 degrees Fahrenheit, diffuse warmth throughout the system, give tonicity to the nerves, equalise the circulation, impart electricity to the blood (an important adjunct to the cure of inflammatory diseases, in which there is invariably a deficiency), and in many instances render the administration of drugs totally unnecessary. As a prophylatic to disease, the Vapour Bath is eminently useful, as the skin being kept beautifully soft, and capable of fulfilling all its functions in a healthy manner, the morbid humours, which are continually accumulating in the system, and constituting a most prolific source of disease, are either thrown off or prevented from forming. In illustration of its power in this respect, if a person has imbibed any strongly-smelling substance a short time previous to taking the bath, the napkin with which such person is wiped will smell strongly of the same. Another important property of the Vapour Bath is, that it increases the sensibility of the system to the impression of medicine, more particularly does it accelerate the effects of alterative medicines, as it changes the condition of the fluids, and increases the power of the absorbent system.

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* Private Medical Bath Establishment, 105, Great Russell Street, Bloomsbury, W.C.

One great feature in these baths, to which attention is specially invited, is the principle of medication, by means of which many important organs of the body can be acted upon with a greater degree of certainty than by internal medicines.

A Medicated Vapour Bath, as commonly understood and administered, is simply the impregnation of the vapour with a little volatile oil to render it agreeable to the olfactory nerves—but this is a mere farce. The true process of medication consists in being able by means of compressed steam, to suspend in the vapour by which the patient is surrounded, the essential properties of plants suited to the nature of the case.

The specific effects of Medicated Vapour Baths may be stated as follow :—They equalise the circulation of the blood, and hence remove coldness of the extremities and tendency to apoplexy—re-establish insensible perspiration, the main-spring of healthy life—diminish nervous irritability—cure epilepsy and cutaneous diseases—remove the pernicious effects of mercury—diminish and cure dropsical effusions, asthma, quinsy, croup, hooping-cough, bronchitis, and diphtheria—produce a natural action of the digestive organs and thus cure dyspepsia—promote the cure of scrofula—remove rheumatic pains, swelling of the joints, and lumbago—prevent and cure internal hœmorrhage—cure acute and chronic inflammations of all kinds—relieve gout in all its forms, and cure diabetes, with greater certainty and in a shorter period of time than any other agent.

Alcoholic Vapour Baths.—This bath is entirely new to this country, but in America it is well known and highly appreciated. It exerts a powerful and highly beneficial influence upon the whole of the animal economy; is more powerful in its effects than the vapour of water; and in acute disease, where free perspiration is desired, it never fails to produce it; hence in all cases of inflammatory disease, colds, rheumatism, and dropsy, it is invaluable, and may be considered as a prelude to a safe and speedy cure.

Besides the aqueous matter of perspiration thrown out from the body, there is also freed from the sub-cutaneous glands an oleaginous substance, which in many unhealthy conditions of the system concretes upon the surface, and forms a positive mechanical obstruction to perspiration, and the effete matter which it was destined to carry off in solution is thrown back upon the different tissues, and acts as an irritant, or rather re-enters as a poison; to remove this, recourse is had to the Alkaline Hand Bath, by which means the skin is thoroughly cleansed, while its vessels are gently stimulated in a manner that experience has shown to be highly conducive to the permanent healthy performance of their functions.

Shower Baths.—These follow the application of the Alkaline or Vapour Bath, and are used with various degrees of heat, in accordance with the power of the system to effect a re-action. Where there exists a robust condition of body, the cold shower is used with marked benefit, as, in a few minutes, a beautiful healthful glow is established on the surface, accompanied with a pleasurable sensation of warmth, thus acting as a powerful tonic. To persons of less robust constitution, the Graduated

Shower is used; this consists of a shower of warm water, gradually changing to tepid and cold; after which the patient is dried and a moderate degree of friction applied to the surface to promote reaction. In persons of debilitated constitutions the warm shower only is used, with friction as before. In all cases the Shower Bath is infinitely superior to the Warm Bath after the Vapour, as the debilitating effect of immersion in warm water entirely counteracts the beneficial influence of the vapour.

Electro-Chemical Baths.—Many of the complaints from which people suffer, and for which Medical Practitioners can find neither name nor remedy, are owing to the presence of mercury, lead, or zinc, in the system, the result of former treatment for some disease in which it was deemed necessary to administer one or more of those metals. Such complaints have hitherto baffled the best medical skill that has been brought to bear against them; thousands have been ruined and hurried to premature graves through the painful and pernicious action of mercury alone, which, producing a chemico-vital change in the body, alters the character of the disease for which it was administered; then remaining for a time latent, eventually is roused into activity and produces innumerable forms of disease of the nerves and bones, ulcers of the extremities, and hypochondriasis in its worst form.

Up to the present time it has been found impossible thoroughly to rid the system of metallic substances after having once found an entrance in any quantity, but this desideratum is now accomplished by means of the Electro-Chemical Bath.

These Baths combine the beneficial effects of Medicated

Vapour with the Electric Current and Chemical Solvent, and in all diseases produced by the existence of metals in the body are specific.

This chapter on "Medicated Baths" might be very much extended; but enough has been said to show the new resources possessed by medical art in these appliances. The importance of a healthy skin to the welfare of the animal economy is evidently becoming more widely recognised, since the greatest improvements in medical treatment of late years have lain in new processes of relieving the internal structure through the skin. Some inflammatory diseases of the viscera, and we believe the lungs, have lately been treated in France successfully by prolonged applications of the warm bath, of seven or eight hours duration.

CHAPTER VIII.

ANCIENT SOAPS.

Soap is first mentioned in the works of Pliny and Galen. In the former, at xviii., 12, sect. 51, p. 475, where he tells us that soap was made of tallow and ashes; that the best was made of goat's tallow and the ashes of the beech tree, and that there were two kinds of it, hard and soft. The author of a work on simple medicines, which is ascribed to Galen, but which, however, does not seem to have been written by that author, and of which only a Latin translation has been printed, speaks of soap being made by a mixture of ox's, goat's, or sheep's tallow, and a lye of ashes strengthened with quicklime. He says the German soap was the purest, the fattest, and the best, and that the next in quality was the Gallic. Gallic and German soaps are often mentioned by later writers,* as well as by the Arabians, sometimes on account of their external use as a medicine, and sometimes on account of their use in washing clothes. The latter purpose is that for which soap is principally employed in modern times, but it does not seem to have been the cause of German soap being introduced at Rome. Washing there was the occupation of indigent scourers, who did not give themselves much trouble concerning foreign commodities. The German soap, with which, as Pliny tells us, the Germans coloured the hair red, was imported into Rome for the use of the fashionable ladies and their gallants. During the reign of Vespasian, the cheapest and the most common article used for washing was the urine of men and animals, the cleansing power of which is still well known to some of our cloth manufacturers. The ancients also used the juice of certain plants (probably mixed their dye-liquors with it), particularly a plant often mentioned by Theophrastus and Pliny under the name of struthium, which was probably the Grypsophila Struthium of Linnæus,* a plant still used for washing in the lower parts of Italy and Spain. Bauhin describes a soap plant which grows in Syria with prickly leaves like a thistle and a thick root, with a sharp acrid taste. The root was employed for washing clothes and wool, and the confectioners of Damascus formed of it, with honey and wine, a kind of sweetmeat which appeared as white as if it had been made of the finest flour and sugar, and which was so hard that it could scarcely be broken with the teeth. Beans, made probably into a meal, were also used, according to Galen. Fuller's-earth was employed to scour and absorb greasy dirt, and various other marly earths of a similar nature, were also employed: they were named from the countries which produced them. They also used these earths for whitening many kinds of cloth, in the same manner that soldiers at the present day give their dress a brighter appearance. When a perfect white was required, a kind of white potter's-clay or marl was employed, and the closer it adhered to the cloth, and the less easily it could be rubbed out, the more was it preferred. The poor people at Rome rubbed it over their clothes on festivals, in order that they might appear brighter.

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* Theodore Priscianus, lib. 1, cap. 3, et lib. 1. 8., Plin. Valer, I. 13., etc.

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* Hist. Plant. xxix., 43. p. 347.

Pliny has described the method of washing used at Rome. The cloth was first washed with Sardian earth; it was then fumigated with sulphur, and afterwards rinsed with real Cimolian earth. Pliny seems to have been particular in mentioning real Cimolian earth, because the false kind became black by the steam of the sulphur which the cloth absorbed. It is probable that the spurious kind was adulterated with some metallic earth or white lead.* There were various kinds of soap used by the ancients, as there are at the present day. Martial recommends pilæ Mattiacæ as a soap which prevents grey hair.† This and the Batavian foam or lather, which the Romans employed for colouring their hair, were probably "German soap."

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[*] See Beckmann's "Hist. of Inventions," vol. 3, p. 241, et seq.

[†] Mart. xiv., 27.

CHAPTER IX.

MANUFACTURE AND CONSTITUENTS OF MODERN SOAP.

Some chemical writers describe, under the title of soap,* every compound which may result from the union of fats with the various earths and metallic oxides, a latitude of nomenclature which common language cannot recognise, and which would perplex the manufacturer as well as the reader. Soaps are distinguished into two great classes, according to their consistence—the hard and the soft; the hard being produced by the action of soda upon fats, the soft by that of potash. The nature of the fats contributes also somewhat to the consistence of soaps. Thus tallow, which contains much stearine and margarine, forms, with potash, a more consistent soap than liquid oils will do, which consist chiefly of oleine. The drying oils, such as those of linseed and poppy, produce the softest soaps.

The manner of manufacturing soap will be best understood if we state the constituents which are employed in the production of the various kinds.

It was found by Chevreul that different varieties of fatty matter consist chiefly of two kinds: one hard, to which he gave the name of *stearine*; and the other soft, which he termed *oleine*. He also discovered that stearine is composed of stearic acid and a peculiar principle which, on account of its sweet taste, he named *glycerine;* and it was further proved by his experiments that oleine consists of oleic acid and glycerine; stearine is, therefore, a stearate of glycerine, and oleine an oleate of the same substance.

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* The term soap is derived from the Latin word *sapo*, from the German *sepe*, now written *seife*.

The fatty matters used in the manufacture of household or common soap are—kitchen stuff, coarse tallow, horse fat, bone fat, rancid palm oil, resin—all coarse fatty matters.

Fats used in the manufacture of the first quality soaps are —suet, beef marrow, cocoa-nut oil, palm oil, olive oil, sweet almond oil, castor oil, neatsfoot oil, lard, tallow, and many other fats that are not generally used.

Many soap makers mix pipe clay and other earthy materials in the manufacture for the purpose of producing a low-priced article.

Now the idea of persons using the same soap for the skin they would employ in scrubbing floors or washing coarse materials, will at once strike every reflecting person as wholly preposterous. The common or low-priced toilet soaps are made by combining, in different proportions, soaps of the first and second qualities, and disguising the compound with colouring matter and some cheap essential oil.

The best toilet soaps are made by re-melting those soaps which are made of the best materials, and combining them in their proper proportions so as to form a good emollient soap, at the same time perfuming it with such essences as are most agreeable to the olfactory nerves, and entirely harmless or actually salutary to the skin.

CHAPTER X.

HARD SOAP.

All soaps having soda as their base are classified under the general name of "hard soap." Their chief characteristics are firmness and neutrality.* The fat of the soap, in the Northern countries of Europe, is usually tallow, and in the Southern, coarse olive oil. Different species of grease are saponified by soda, with different degrees of facility; among oils, the olive, sweet almond, rapeseed, and castor oil, are most easily saponified, and among solid fats, tallow, bone grease, and butter, are most easily saponified. According to the practice of the United Kingdom, six or seven days are required to complete the formation of a pan of hard soap, and a day or two more for settling the impurities, if it contains resin. From twelve to thirteen cwt. of tallow are estimated to produce one ton of good soap. Some years ago, in many manufactories, the tallow used to be saponified with potash lyes, and the resulting soft soap was converted, in the course of the process, into hard soap, by the introduction of muriate of soda, or weak kelp lyes, in sufficient proportion to furnish the proper quantity of soda by the re-action of the potash upon the neutral salts; but the high price of potash, and the diminished price, as well as improved quality of the crude sodas, have led to their general adoption in soap works. The soda-ash used by the soap-boiler contains in general about thirty-six per cent. of real soda, in the state of dry carbonate, mixed with muriate of soda, and more or less undecomposed sulphate. The barillas from Spain and Teneriffe contain from eighteen to twenty-four per cent. of real soda. The alkali, in both states, is employed in England; barilla being supposed by many to yield a fine white or curd soap, on account of its freedom from sulphur. The crude soda of either kind being ground, has to be stratified with lime in cylindrical cast-iron vats, from six to seven feet wide, and from four to five feet deep; the lowest layer, consisting, of course, of unslaked or shell quick-lime. The vats have a false bottom, perforated with holes, and a lateral *tubulure* under it, closed commonly with a wooden plug, similar to the *épine* of the French soap pans, by which the lees trickle off clear and caustic, after infiltration through the beds of lime. The quantity of lime must be proportional to the carbonic acid in the soda. Upon one ton of tallow put into the soap pan, about 200 gallons of soda lye, of specific gravity 1,040 being poured, heat is applied, and after a very gentle ebullition of about four hours, the fat will be found to be completely saponified, by the test of the *spatula trowel*, or pallet knife, for the fluid lye will be seen to separate at once upon the steel blade from the soapy paste. Such lyes, if composed of pure caustic soda, would contain four per cent. of alkali; but, from the presence of neutro-saline matter, they seldom contain so much as two per cent. In fact, a gallon may be estimated to contain not more than two ounces, so that 200 gallons contain twenty-five pounds of real soda. The fire being withdrawn from the soap pan, the mass is allowed to cool during one hour, or a little more, after which the spent lyes, which are not at all alkaline, are run off by a spigot below, or pumped off above by a pump set into the pan. A second similar charge of lye is now introduced into the pan, and a similar boiling process is renewed. Three such boils may be given in the course of one day's work by an active soap maker. Next day the same routine is resumed with somewhat stronger lyes, and so progressively, till, towards the sixth day, the lye may have the density of 1,160, and will be found to contain six per cent. of real soda. Were the lye a solution of pure caustic soda, it would contain at this density no less than 14¾ per cent. of alkali. The barillas always contain a small proportion of potash, to which their peculiar value, in making a less brittle or more plastic hard soap than the fictitious sodas, may with great probability be ascribed. Soda which contains sulphurets is preferred for making the mottled or marble soap, whereas the dissulphuretted soda makes the best white curd soap. Mottling is usually effected in the London soap works by introducing into the nearly finished soap in the pan a certain quantity of the strong lye of crude soda, through the rose spout of a watering can. The dense sulphuretted liquor in descending through the pasty mass, causes the marbled appearance. In France, a small quantity of the solution of sulphate of iron is added during the boiling of the soap, or rather with the first service of the lyes. The alkali seizes the acid of the sulphate, and sets the protoxide of iron free to mingle with the paste, to absorb more or less oxygen, and to produce thereby a variety of tints. A portion of oxide combines also with the stearine to form a metallic soap. When the oxide passes into the red state, it gives the tint called

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* Morfit.

manteau isabelle. As soon as the mottler has broken the paste, and made it pervious in all directions, he ceases to push his rake from right to left, but only plunges it perpendicularly, till he reaches the lye, making it act like the stroke of a piston in a pump, whereby he lifts some of the lye, and spreads it over the surface of the paste. In its subsequent descent through the numerous fissures and channels, on its way to the bottom of the pan, the coloured lye impregnates the soapy particles in various forms and degrees, whence a varied marbling results. Three pounds of olive oil afford five pounds of marbled Marseilles soap of good quality, and only four pounds four ounces of white soap, showing that more water is retained by the former than the latter. Oil of grains, as linseed and rapeseed, do not afford so solid a soda soap as oil of olives; but tallow affords a still harder soap with soda. Some of the best Windsor soap made in London contains one part of olive oil (gallipoli) for every nine parts of tallow. Much of the English hard soap is made with kitchen and bone fat, of a very coarse quality.

It is common now at Marseilles to mix ten per cent. of the oil of grains with olive oil, for which purpose a large proportion of the oils extracted from seeds in the mills of the Department du Nord is sent to Marseilles; but five per cent. of poppy-seed oil, mixed with tallow, renders the soap made with the mixture stringy, and unfit for washing, because the two species of fat decline to amalgamate.

CHAPTER XI.

YELLOW OR RESIN SOAP.*

RESIN, although very soluble in alkaline menstrua, is not, however, susceptible, like fats, of being transformed into an acid, and will not of course saponify, or form a proper soap by itself. The more caustic the alkali, the less consistence has the resinous compound which is made with it. Hence, fat of some kind, in considerable proportion, must be used along with the resin, the minimum being equal parts; and thus the soap is far from being good. As alkaline matter cannot be neutralised by resin, it preserves its peculiar acrimony in a soap poor in fat, and is ready to act too powerfully upon woollen and all other animal fibres to which it is applied. It is said that rancid tallow serves to mask the strong odour of resin in soap, more than any oil or other species of fat. From what we have just said, it is obviously needless to make the resin used for yellow soaps pass through all the stages of the saponifying process, nor would this indeed be proper, as a portion of the resin would be carried away, and wasted with the spent lyes. The best mode of proceeding, therefore, is first of all to make the hard soap in the usual manner, and at the last service or charge of lye—namely, when this ceases to be absorbed, and preserves in the boiling pan its entire causticity—to add the proportion of resin intended for the soap. In order to facilitate the solution of resin in the soap, it should be reduced to coarse powder, from one-third to one-fourth of the weight of the tallow. The boil must be kept up for some time with an excess of caustic lye; and when the paste is found, on cooling, to leave a resinous varnish on the skin, we may consider the soap to be finished. We next proceed to draw off the superfluous lyes, and to purify the paste. For this purpose a quantity of lyes at 80 degrees B. being poured in, the mass is heated, worked well with a rake, then allowed to settle, and drained of its lyes. A second service of lyes at 4 degrees B. is now introduced, and finally one at 2 degrees; after each of which there is the usual agitation and period of repose. The pan being now skimmed, and the scum removed for another operation, the soap is ladled off by hand-pails into its frame-moulds. A little palm oil is usually employed in the manufacture of yellow soap, in order to correct the flavour of the resin, and brighten the colour. This soap, when well made, ought to be of a fine wax-yellow hue, be transparent upon the edges of the bars, dissolve readily in water, and afford, even with hard pump-water, an excellent lather. The frame works of hard soap are composed of strong wooden bars, made into the form of a parallelogram, which are piled over each other, and bound together by screwed iron rods, that pass down through them. A square well is thus formed, which in large soap manufactories is sometimes ten feet deep, and capable of containing a couple of tons of soap.

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* Commonly called "Yankee soap," from being largely manufactured in America.—MORFIT.

Mr. Sheridan, some time since, obtained a patent for combining silicate of soda with hard soap, by triturating them together in the hot pasty state with a crutch in an iron pan. In this way from ten to twenty of the silicate may be introduced. Such soap possesses very powerful detergent qualities, but it is apt to feel hard and be somewhat gritty in use. The silicated soda is prepared by boiling ground flints in a strong caustic lye, till the specific gravity of the compound rises to nearly double the density of water. It then contains about 35 grains of silica, and 46 of soda-hydrate, in 100 grains.* Hard soap, after remaining two days in the frames, is at first divided horizontally into parallel tablets, three or four inches thick, by a brass wire, and these tablets are again cut vertically into oblong nearly square bars, called wedges in Scotland.

The principal seats of the manufacture of soap in England are Liverpool and Runcorn, Brentford, Bristol, Hull, and London. There are also soap works of considerable extent at Bromsgrove, Newcastle, Gateshead, Warrington, and Plymouth. In Scotland two-thirds of the total quantity of soap are made at Glasgow and Leith. In Ireland soap is chiefly made at Belfast, Londonderry, Limerick, and Cork.

The quantities of soap made in Great Britain in 1848 were as follow, expressed in pounds:—

	Silicated.	Hard.	Soft.
England	1,572,468	157,667.499	9,689,090
Scotland	605,420	14,187,429	5,730,847
	2,177,888	171,854,928	15.419,937

Making a total of 189,452,753lbs. The foreign soap imported that year amounted only to 91,784lbs. The British soap exported to foreign countries amounted to 11,187,997lbs., with a declared value of £155,267.

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* By Dr. Ure's experiments upon the liquid silicate made at Mr. Gibb's soap factory.

CHAPTER XII.

SOFT SOAPS.

SOFT soaps are usually made in this country with whale, seal, olive, and linseed oils, and a certain quantity of tallow; on the Continent, with the oils of hempseed, sesame, rapeseed, linseed, poppy-seed, and colza, or with mixtures of several of these oils. As hard soap has soda for a base, so soft soap has a potassa base. Where tallow is added, as in Great Britain, the object is to produce white and somewhat solid grains of stearic soap in the transparent mass, called figging, because the soap then resembles the granular texture of a fig. The potash lyes should be made perfectly caustic, and of at least two different strengths; the weakest being of specific gravity 1.05, and the strongest 1.20, or even 1.25. Being made from the potashes of commerce, which contain seldom more than 60 per cent., and often less, of real alkali, the lyes correspond in specific gravity to double their alkaline strength; that is to say, a solution of pure potash, of the same density, would be fully twice as strong. The following is the process followed by respectable manufacturers of soft soap upon the Continent. A portion of the oil being poured into the pan, and heated to nearly the boiling point of water, a certain quantity of the weaker lye is introduced. The ebullition is kept up in the gentlest manner possible, and some stronger lye is occasionally added, till the workman judges the saponification to be perfect. The boiling becomes progressively less tumultuous, the frothy mass subsides, the paste grows transparent, and gradually thickens. The operation is considered to be finished when the paste ceases to affect the tongue with an acrid pungency, when all milkiness and opacity disappear, and when a little of the soap placed to cool upon a glass plate assumes the proper consistency. A peculiar phenomenon may be remarked in the cooling, which affords a good criterion of the quality of the soap. When there is formed around the little patch an opaque zone, a fraction of an inch broad, this is supposed to indicate complete saponification, and is called the strength; when it is absent, the soap is said to want its strength. When this zone soon vanishes after being distinctly seen, the soap is said to have *false strength.* When it occurs in the best form, the soap is perfect, and may be secured in that state by removing the fire, and then adding some good soap of a previous round, to cool it down, and prevent further change by evaporation. Two hundred pounds of oil require for their saponification 72 pounds of American potash of moderate quality, in lyes at 15 degrees B.; and the product is 460 pounds of well-boiled soap. If hempseed oil has not been employed, the soap will have a yellow colour, instead of the green, so much in request on the Continent. This tint is then given by the addition of a little indigo. This dye-stuff is reduced to fine powder, and boiled for some hours in a considerable quantity of water, till the stick with which the water is stirred, presents, on withdrawing it, a gilded pellicle over its whole surface. The indigo paste diffused through the liquid is now ready to be incorporated with the soap in the pan, before it stiffens by cooling.

CHAPTER XIII.

TOILET SOAP.

The importance of attending carefully to the kind of soap and noticing its constituent parts, and consequent manufacture, before we use it, is well exemplified by the fact we have incidentally intimated, that the skin, as well as the parts beneath it, possess the most absorbent properties. It is well known that mercurial preparations, if placed long in contact with the skin, produce salivation. Hence the marks made by soldiers, and more frequently sailors, on the arms and other parts of the body, are merely impregnations effected by gunpowder, and which remain permanent through life. It is also a curious fact that after death the human skin, for a considerable time, possesses the same imbibing power. "When examined chemically, the scarf skin is found to be composed of a substance analagous to dried white of eggs—in a word, albumen.* Now, albumen is soluble in the alkalies, and these are agents which are commonly employed for purifying the skin. Soap, whatever its specific name, is a compound of the alkali soda with oil, the former being in excess. When used for washing, the excess of alkali combining with the oily fluid with which the skin is naturally bedewed, removes it in the form of an emulsion, and with it a portion of the dirt. Another portion of the alkali softens and dissolves the superficial stratum of the scarf-skin, and, when this is rubbed off, the rest of the dirt disappears. So that every washing of the skin with soap removes the old face of the scarf-skin, and leaves a new one; and were the process repeated to excess, the latter would become so much attenuated as to render the body sensible to a touch too slight to be felt through its ordinary thickness. On the other hand, where the scarf-skin and the dirt are rarely disturbed by soap, the sensibilities of the skin are necessarily benumbed.

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* The scarf skin also contains five per cent. of gelatinous matter; one per cent. of salts, consisting of lactates, phosphates, and sulphates of potash lime and ammonia; oxide of iron and manganese, and a minute quantity of fat; the remainder being albumen.—E. Wilson.

The proper inference to be drawn from the preceding remarks is in favour of soap as a detergent to the skin. The effect, however, of the soap upon the skin, must necessarily depend upon the quantity of the alkali employed in its manufacture, and its consequent degree of causticity. Every one is familiar with the difference between the action of pearlash and soda, for while the effect of the latter is comparatively inert, the former, by its causticity, produces considerable irritation. The soaps which have the alkalis for their bases are soluble in water, though the solution is in general milky: they are also soluble in alcohol, and the solution is used frequently as a test of what is called the hardness of water: acids also decompose soaps.

The soft fancy toilet soaps are divisable into two classes:—1. Good potash soap, coloured and scented in various ways, forms the basis of the Naples and other ordinary soft soaps of the perfumer; 2. Pearl soap (*savon nacré*), which differs from the other both in physical aspect, and in mode of preparation.

CHAPTER XIV.

ORDINARY SOFT TOILET SOAP.

The manufacture being conducted on the principles already laid down, presents no difficulty to a man of ordinary skill and experience; the only point to be strictly attended to, is the degree of evaporation, so as to obtain soap of uniform consistence. The fat generally preferred is good hog's lard.

Soft soap is directed by the London Pharmacopœia to be made with potash and olive oil, but this order is seldom complied with. Soft soap, in which both soda and potash are used, is made with olive and other oils and tallow. It is employed only to form the compound sulphur ointment. Common soft soap is made with train or cod-fish oil and tallow; from its ordinary appearance, it is sometimes called Black Soap. If a slight excess of alkali exist, its detergent powers are thereby heightened. Soft soap is of great service in many cutaneous diseases, several of which, when in a mild form, may be cured by it alone. It may be rendered still more useful by the addition of sulphur or sulphuret of potash (liver of sulphur). In the treatment of scabies, ring worm, and such diseases, this application is far superior to the ointments and other greasy compounds commonly employed, which increase the uncleanness by which the disease is aggravated. It is also much cheaper.

Windsor Soap, originally made in England, was always manufactured from mutton suet. It is now largely made in France. So long as the French adhered to the old English plan of making it wholly from mutton suet, its quality was inferior, for it became rancid and yellow by exposure. By mixing olive oil and lard with it they now greatly improve it.

CHAPTER XV.

PEARL SOFT SOAP.

It is only a few years since the process for making this soap became known in France. In many respects, it differs little from the preceding, but it owes its beautiful aspect to minute manipulations. The perfume given to it, is always essence of bitter almonds; on which account the soap is called Almond Cream—Crème D'Amandes.

All soaps of fine qualities and emollient properties, and which are manufactured of pure and choice materials, and with great care and cleanliness, belong to the class of "Toilet Soaps." They may be made hard or soft, with a potassa or soda base.

Toilet soft soaps are commonly met with under the title of "shaving cream." The "shaving sticks" mentioned at the end of the work are an entirely new invention by the author—uniting with great convenience of form all the qualities of the "Transparent Soap," of which we have yet to speak.

"Savonnettes" are made of the best soaps, which, instead of being shaped into cakes, are moulded into spherical forms, and are known as "wash balls." The skill and fancy of the savonnier are continually displayed by the devices he employs in the production of shapes as well as qualities.

"Musk Soap" (*savon musqué*), for whitening and softening the hands, is, of course, scented with musk.

CHAPTER XVI.

HARD SOAPS FOR THE TOILET.

The soaps prepared by the perfumer are distinguished into different species, according to the fat which forms their basis. Thus there is soap of tallow, of hog's lard, of oil of olives, of almonds and palm oil. It is from the combination of these different sorts, mingled in various proportions, and perfumed agreeably to the taste of the consumer, that we owe the vast number of toilet soaps sold under so many fantastic names. One sort is rarely scented by itself, as a mixture of several is generally preferred; in which respect every perfumer has his peculiar secret. Some toilet soaps, however, require the employment of one kind more than of another. Formerly the Windsor soap was made in France, wholly with mutton suet; and it was accordingly of inferior value. Now, by mixing some olive oil or lard with the suet, a very good Windsor soap is produced. The fat of the London Windsor is nine parts of good ox tallow, and one of olive oil. A soap made entirely with oil and soda, does not afford so good a lather as when it contains a considerable proportion of tallow. The soaps made with palm oil are much used; when well made, they are of excellent quality, and ought to enter largely into all the coloured sorts. They naturally possess the odour of violets. The soaps made with oil of almonds are very beautiful, and preserve the agreeable smell of their perfume; but being expensive, are introduced sparingly into the mixtures of most manufacturers. Some perfumers are in the habit of making what may be called extempore soaps. This method, however, ought never to be adopted by any person who prefers quality to beauty or appearance. Such soap is, indeed, admirably white and glistening, contains no more water than is necessary to its constitution, and may, therefore, be sold the day after it is made. But it has counterbalancing disadvantages. It soon becomes very hard, is with difficulty soluble in water, and, if not made with tallow, does not lather well. Hog's lard is very commonly used for making this soap. This extemporaneous soap is now seldom or never made by respectable manufacturers. In making Windsor soap, the admixture of olive oil is advantageous, because being richer in oleine than suet it saponifies less readily, and thus favours the formation of a more perfect neutral combination.

The following is an analytical summary of the components of various kinds of soap:—

Olive oil takes the first rank as soap material.

The "soap of sweet almond oil" is next.

"Colza oil soap" is less solid, and yellowish gray.

The "oil of rapeseed soap" is of grayish yellow; more consistent than that of colza oil.

"Oil of beech nut soap" is of a dirty gray colour, greasy, pasty, and clammy, and becomes yellow.

"Poppy oil soaps" are pretty much of the same nature.

"Nut oil soap" is of a yellowish white, and becomes brown.

"Linseed oil soap" is whitish at first, but becomes yellow.

"Sperm oil soap," from a dirty gray colour, turns to a reddish brown, and has a fishy odour. All these soaps are more or less soft, greasy, and clammy.

"Suet soaps" and solid fat soaps are firm, and, except in a few instances, white.

"Butter soap" will have a rancid odour if the butter be rancid.

"Palm oil soap" retains its peculiar and agreeable odour.

"Lard soap" is hard, white, and inodorous.

"Cocoa nut soap" has the great advantage of being to a degree soluble in saline solutions, and is therefore well adapted for washing in salt or sea water. It is sometimes called "Marine soap."

Soaps from castor oil and "spermaceti" hold the first rank in emollient properties.

"Human fat" gives a hard soap, which dries quickly and becomes yellow.

"Bone fat," though slushy, will make an excellent common soap, mixed with more solid fat.

"Horse fat soap" is hard, white, and without disagreeable odour.

"Red oil soap" is the so-styled chemical olive soap, which has added to it solid fat which increases its firmness.*

There is a "green soap" made from whale or cod oil and tallow, and a "bran soap" made from wheat or bran, said to possess great excellence. There is a "beef marrow soap" made which ought to be good to eat. "Sand soap" and "flint soap" are, of course, especial detergents.

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* Chemistry applied to the Manufacture of Soap and Candles, by Campbell Morfitt, Philadelphia.

CHAPTER XVII.

TRANSPARENT SOAP.

By this time the casual reader of these pages must have a clear idea of the many considerations atttached to the question of pure soap. Dirt, as Lord Palmerston defined it, is "matter in the wrong place." To remove this to the right place, so far as the human being is concerned, and to remove it without detriment to the health of the skin, is the function of soap. Notice has often been taken of the remark of one who said, "Show me the ballads of a nation, and I will predict the nature of the law of the people who sing them." A modern chemical philosopher, Liebig, has pronounced the same panegyric on soap that the philosopher we have referred to pronounced on songs—that is to say, Liebig proposes to predict the character of a nation by the quantity of soap used in it. He considers the consumption of soap a measure of the wealth, civilization, health, and purity of the people. So much for the national aspect of the question, but personally it is not less interesting. To each individual it becomes of moment that he should be well assured of the chemical suitability of that particular kind of soap he uses. It is also a matter of moment what shall be the chemical nature of that detergent which we shall employ daily to keep open and healthy those seven millions of pores, and twenty-eight miles of ducts, united in the external cuticle of the human body. It is the function of that great personal sanitory agent, soap, to put that organ, which has the whole nervous system expanded upon its surface (and which carries on the double office not only of expelling effete matter from the system, but of bringing the whole body under the influence of the atmosphere) into that condition which leads to full vitality, vigour, and strength.

The best soaps for the skin are those which have undergone a process in their manufacture by which the alkaline strength is reduced, or originally employed in a quantity insufficient to produce any irritation. This desideratum has been fully accomplished by the original discoverer and manufacturer of the transparent soap. This soap has the remarkable property of being quite transparent, forming a quick, ample, and emulcent lather, at the same time cleansing the skin most effectually. The art of making transparent soap was, as we have elsewhere said, originally discovered by Mr. Andrew Pears in 1807, and the recipe, genuine and unaltered, remains alone in the hands of his successor, Mr. Francis Pears.

A considerable sensation was created in the commerce of perfumers on the first introduction of this soap. The value of a soap unlike any which preceded it, which might be used by the most delicate ladies or invalids, proved its importance at once, and a very large sale was the early consequence. Like other useful discoveries, its introduction was followed very speedily by numerous imitations, all differing more or less essentially from the original. In due time, a great variety of recipes were published under the same appellation. But the original recipe has always remained in the family of the discoverer. It not unfrequently happens, however, with discoveries of importance, that subsequent experiments enable us to improve upon the original, such has been the case with this soap. The author's great experience as a soap refiner has enabled him to ascertain which of the fatty substances and of the alkalies are best adapted for the manufacture of a pure and perfectly innocent soap; while the complicated apparatus he has invented enables him to separate from the best made soap a greater portion of the alkali than formerly, and at the same time to render the soap most emollient, property which has induced most medical practitioners to recommend it to persons of delicate constitutions; for not possessing any irritable or acrimonious qualities, it can be applied to the skin with the happiest success. The odoriferous properties being also of consequence, they have been so studied that no perfumes are used in its manufacture which are in any way injurious to the most sensitive skin. For shaving, the author's Shaving Stick will be found most convenient, as it saves time and is more cleanly than the old mode of using the shaving dish. As many attempts have been made to render shaving a comfort instead of a pain and an inconvenience, and many have been the failures owing to the caustic qualities of the soap used, which so distress the cuticle as to render the process a complete nuisance, this discomfort may now be removed by the use of the above Shaving Stick. The author will now conclude by stating that the ingenuity of all imitators has been insufficient to produce anything like the genuine manufacture. If genius, as Dr. Johnson says, be the power of making efforts, then there must be a lamentable deficiency of genius among the many manufacturers of toilet soaps, for never have so many abortive efforts been exerted on any object as in the present case.

END.

WELLCOME LIBRARY INSTITUTE

"The Jury have tried Transparent Soap, 25 YEARS OLD, manufactured by A. and F. Pears, of which A. Pears was the inventor, and found it to be very good."—See Jurors' Report, GREAT EXHIBITION OF THE INDUSTRY OF ALL NATIONS, 1851.

A. & F. PEARS, PERFUMERS AND SOAP REFINERS,

INVENTORS OF THE GENUINE TRANSPARENT SOAP,

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Three Doors West of the British Museum.

PEARS'S GENUINE TRANSPARENT SOAP. Recommended by the Faculty as the most perfect Cleanser and Emollient for the Skin.

Soaps are generally selected on account of their odoriferous qualities, irrespective of their cleansing and soothing properties, and consequently much mischief often arises without the real cause being suspected. The odoriferous quality being most desirable, Mr. Pears has the highest satisfaction in announcing that he has succeeded in combining a most exquisite and durable odour with the Transparent Soap, in its purest form, and which is at the same time the most perfect cleanser and improver of the skin.

The surface of the skin of persons of delicate constitution, being the most subject to injury from intense heat, severe cold, inclement winds, and other vicissitudes of the weather peculiar to this climate, it is with unaffected satisfaction that the Proprietors state that this preparation, possessing no irritable or acrimonious particles, may be applied to the most tender skin with the happiest success; indeed, infants of the weakest frame and earliest age may receive the application with the greatest benefit, a circumstance that obviously renders it pre-eminently deserving the attention of the Guardians of Children.

The great excellence of this soap likewise is, that it may be used with equal pleasure in hard water as soft, a circumstance which renders it extremely agreeable to gentlemen of the navy, or families travelling to other countries. Besides, change of air, or climate, never in the least diminishes the invaluable properties it possesses.

For Washing. Square Cakes, price 1s. and 1s. 6d, and large squares, perfumed with Otto of Roses, price 2s. 6d. each; also Wash Balls, price 2s. 6d. each; and non-angular Tablets.

For Shaving.—Gentlemen will find this soap much superior to the Naples, or any Cream or Soap that is offered to the public, and far more pleasant and cleanly to use, especially the much admired SHAVING STICKS for gentlemen travelling. Those persons troubled with tender faces, will find this a most desirable soap, for it not only produces a fine creamy lather that will not dry on the face, but leaves it comfortable and cool after shaving, which is not the case with the numerous caustic alkaline soaps offered for sale, which cause the face to smart, and leave it disagreeably hot and red.

Sold in round cakes, price 1s., 1s. 6d., and 2s. 6d. each. Also Transparent Shaving Sticks, price 1s., 1s. 6d., and 2s. 6d. each, including the case.—This is a most desirable article for Naval or Military Gentlemen, as it can be used equally well with cold or hot water, and produces an instantaneous, unctuous, and consistent lather, which softens the beard, and renders the process of shaving more rapid, easy, and cleanly than any other mode.—Be sure to ask for Pears's Transparent Soap.

CAUTION TO THE PUBLIC.

Messrs. Pears intimate that the superior qualities of this soap may stimulate others to imitate it, but wheresoever or by whomsoever sold, it can never be genuine, unless each piece of their Transparent Soap contains this caution, and signed thus:—

A & F Pears

A. & F. PEARS

ARE PROPRIETORS OF THE FOLLOWING ARTICLES.

PEARS'S TRANSPARENT SHAVING STICK.

From " Bells Weekly Messenger," August 4th, 1849.

"Of all the luxuries which are attendant upon civilisation, there is not one greater than the attainment of easy shaving. Many attempts have been made to obtain comfort in this desirable act of cleanliness, and many have been the failures; the fault has generally been attributed to the razor; but to our mind, we believe the great cause of pain and uneasiness has generally resulted from the impure qualities of the soap which is used, the astringent properties of which affect the skin, and so distress the cuticle, that shaving is to many a positive nuisance. This discomfort may now be entirely removed by the use of Pears's Transparent Shaving Sticks, which are composed of such a quality of soap as to make the morning toilette an agreeable task. We have tried the article, and can recommend it as most pleasant and successful."

PEARS'S QUININE DENTIFRICE,

FOR THE TEETH AND GUMS.

There are certain essential requisites in the composition of a Dentifrice, necessary to form such a preparation as will produce the effect of cleaning and whitening the teeth without injuring the enamel, and by strengthening the gums to render them firm, florid, and healthy. This Dentifrice is offered to the public as a preparation perfectly harmless; the ingredients which compose it are directed against that collection of injurious matter which so frequently accumulates on the teeth, generally denominated tartar. The gums are not neglected in the composition of this preparation. It only requires to be used, in order to form a correct estimation of the qualities here specified.—Price 1s. 6d. per Box.

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Is the most fragrant and refreshing perfume for the handkerchief; it instantly impregnates the atmosphere of the largest apartment with its refreshing and grateful odour.—Price 2s. and 3s. 6d. per Bottle.

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This new and elegant perfume has this advantage over all others, that its refreshing odour remains after using several days upon the handkerchief, which it does not stain; it is also admirably adapted for the Toilet and Drawing Room, and in counteracting the effects of overheated, close, or infectious air.—Price 2s. and 3s. 6d. per Bottle.

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